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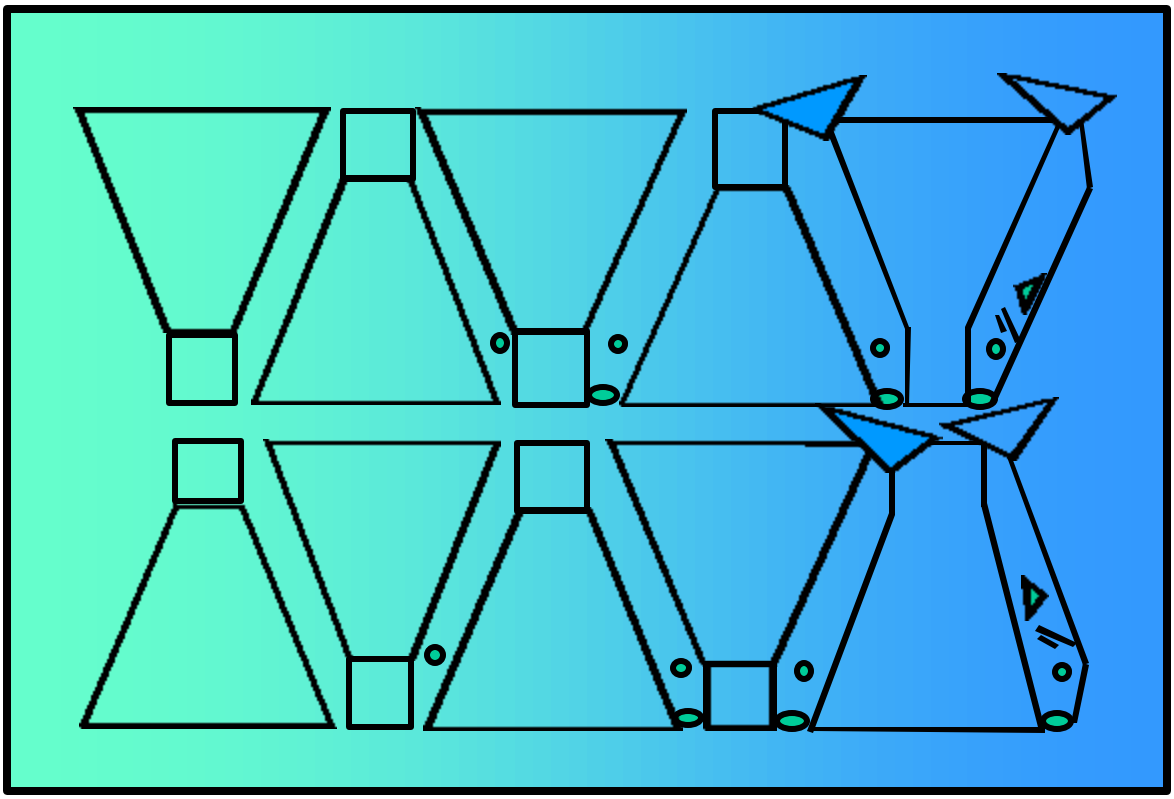
SCIENCE ADVISORY BOARD FY 2000 ANNUAL STAFF REPORT

Making Science Real



Cover Art: *Flask to Fish* by Ms. Stephanie Sanzone

Making Science Real

Science Advisory Board's
FY 2000 Annual Staff Report

Dr. Donald G. Barnes and Ms. Vickie Richardson, Editors

U.S. Environmental Protection Agency
Science Advisory Board

This report is an SAB Staff summary of activities of the U.S. Environmental Protection Agency's Science Advisory Board for Fiscal Year 2000, with projections for Fiscal Year 2001. This report has not been reviewed by the Board or the Agency, and should not be construed as representing the views of either organization.

FORWARD: MAKING SCIENCE REAL

The goal of environmental protection at the USEPA remains the same: To reduce the unreasonable risks to human health and the environment. Science contributes in a fundamental way to identifying, quantifying, and reducing these risks. But in order to do so, science that originates in lab, field, clinical, etc., studies must become "real" in a regulatory context. That is, the hard-won technical information must be interpreted and applied to real problems in the real world in a real time that leads to real solutions.

The FY2000 Annual Report of the SAB Staff highlights a number of examples in which the SAB has helped to make science real through innovative actions, broadened scope of science, and new approaches to transmitting advice. These examples range from the completion of its long-awaited *Integrated Environmental Decision-making* project and joint activities with other Federal Advisory Committee Act (FACA) committees, to a new SAB seminar series on the human side of environmental protection and a series of cooperative workshops with the Agency aimed at improving benefits analysis. Played out against a backdrop of a highly productive year (55 meetings, 37 reports) in which several contentious issues were addressed (e.g., children and cancer, as well as data derived from human testing), these instances of the realization of science stand out and hold significant promise for the future.

Regular readers of *The Annual Report* will note certain formatting changes from previous years. Our goal, however, remains the same: To provide a concise description of the SAB and succinct a summary of its activities that are designed to have a positive impact on the production and use of science at EPA.

Donald G. Barnes
SAB Staff Director

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DEDICATION TO DR. JOAN DAISEY

The FY2000 Annual Report of the SAB Staff is dedicated to Dr. Joan Daisey of the Lawrence-Berkeley National Laboratory. Dr. Daisey served as a Consultant to the SAB from 1986-1991, at which point she became a Member of the Indoor Air Quality Committee (IAQC). In 1993, she became IAQC Chair, as well as Member of the SAB Executive Committee and Member of the Research Strategies Advisory Committee (RSAC). In 1996, under her guidance, the IAQC was renamed as the Integrated Human Exposure Committee. In 1997, EPA Administrator Carol Browner appointed her to serve as Chair of the SAB Executive Committee, a position that she capably held until her untimely death in the spring of 2000.

Dr. Daisey brought to the SAB a deep commitment to its mission, strong leadership to its organization, unswerving integrity to its process, and bounteous joy and grace to share with its members and staff, who had the uncommon pleasure of working with her.

1.0 INTRODUCTION

...ensuring a solid technical basis for environmental protection.

This report is intended to reveal the Science Advisory Board to a wide audience, to those both inside and outside the Agency. The intent is for each reader to gain a broader perspective of the SAB, its activities, and its impact. More specifically, the purpose of this Annual Report of the Science Advisory Board Staff is three fold: a) To provide a succinct introduction to the SAB; b) To provide a summary of the SAB's activities for FY 2000; and c) To offer a near-term projection of future activities.

1.1 SAB FORMATION, AUTHORITY AND FUNCTION

The SAB was established by Congress in 1978 by the Environmental Research, Development, and Demonstration Authorization Act (ERDDAA) (42 U.S.C. 4365). Since 1978, the SAB has operated as an EPA Staff Office, reporting directly to the Administrator. Generally, the SAB does not get involved in or provide advice on regulatory or policy aspects of problems confronting the Agency, because such matters are the jurisdiction and responsibility of the EPA Administrator. The SAB provides independent scientific and engineering advice to the EPA Administrator on the technical basis for EPA regulations. The Board functions as a technical peer review panel. The purpose of the Board is to make a positive difference in the production and use of science at EPA.

The Agency places a value on basing its regulations on a solid scientific foundation. Over the past 23 years, the SAB has assumed growing importance and stature. It is now formal practice that many major scientific issues associated with environmental problems are reviewed by the SAB. For example, the Clean Air Act Amendments of 1977 (CAAA) require that technical aspects of decisions related to all National Ambient Air Quality Standards be reviewed by the Clean Air Scientific Advisory Committee (CASAC), which is administratively housed within the SAB.

The SAB conducts its business in public view and benefits from public input during its deliberations. Through these public proceedings, Agency positions are subjected to critical examination by leading experts in various fields in order to test their technical merits. At the same time, the SAB recognizes that EPA is often forced to take a policy action to prevent an emerging environmental risk before all of the rigors of scientific proof are met. To delay action until the evidence is irrefutable might result in irreversible ecological and health consequences. In such cases, the Agency makes certain assumptions and extrapolations from what is known in order to reach a rational science policy position regarding the need (or lack thereof) for regulatory action. In such cases, the SAB serves as a council of peers to evaluate the soundness of the technical basis of the science policy position adopted by the Agency.

1.2 SAB ORGANIZATION AND MEMBERSHIP

The Agency has continually and successfully recruited top technical talent to fill its leadership positions. Those scientists and engineers who have led the SAB (and predecessor organizations) for the past 23 years are listed in Figure 1. Appendix C3 contains a list of the distinguished scientists, engineers, and economists who served as Chairs of the SAB Committees in FY 2000.

Figure 1. SAB Leadership Over the Past Two Decades

Executive Committee Chairs

&	2000- Present	Dr. Morton Lippmann (Interim Chair) New York University
&	1997-2000	*Dr. Joan Daisey Lawrence Berkeley National Laboratory
&	1993-1997	Dr. Genevieve Matanoski Johns Hopkins University
&	1988-1993	Dr. Raymond Loehr University of Texas-Austin
&	1983-1988	Dr. Norton Nelson New York University
&	1981-1983	Dr. Earnest Gloyna University of Texas-Austin
&	1979-1981	Dr. John Cantlon Michigan State University
&	1974-1978	Dr. Emil Mrak University of California

*deceased February, 2000

Staff Office Directors

&	1988- Present	Dr. Donald G. Barnes
&	1981-1988	Dr. Terry Yosie
&	1978-1981	Dr. Richard Dowd
&	1975-1977	Dr. Thomas Bath

The Board's Executive Committee serves as the focal point to coordinate the scientific reviews by the Board's standing committees. Appendix A1 contains a chart of the FY 2000 SAB's organization. The Executive Committee meets to act on Agency requests for reviews, to hear briefings on pertinent issues, to initiate actions/reviews by the Board which it feels are appropriate, and to approve final reports prior to transmittal to the Administrator. Reports from the separately chartered CASAC and the Council are submitted directly to the Administrator, without need for prior Executive Committee review or approval. The charters for SAB, CASAC, and Council are found in Appendix A2.

Five Committees have historically conducted most of the Science Advisory Board reviews:

(a) Clean Air Scientific Advisory Committee (CASAC):
Mandated by the 1977 Clean Air Act Amendments

(b) Ecological Processes and Effects Committee (EPEC)

(c) Environmental Engineering Committee (EEC)

(d) Environmental Health Committee (EHC)

(e) Radiation Advisory Committee (RAC)

Between 1986 and 1990, five additional committees were added:

(a) Integrated Human Exposure Committee (IHEC): Mandated by the Superfund Amendments and Reauthorization Act in FY 1986

(b) Research Strategies Advisory Committee (RSAC): Requested by the Administrator in response to the Board's Future Risk report in FY 1988

(c) Drinking Water Committee (DWC): Evolved from the EHC in FY 1990.

(d) Advisory Council on Clean Air Compliance Analysis (Council): Mandated by the 1990 Clean Air Act Amendments

(e) Environmental Economics Advisory Committee (EEAC): Requested by the Administrator in response to the Board's *Reducing Risk* report in FY 1990

The Board supplements the activities of these Committees by establishing a variety of ad hoc Subcommittees as needed.

The Members of the SAB constitute a distinguished body of scientists, engineers, and economists who are recognized, non-federal experts in their respective fields. These individuals are drawn from academia, industry, state government, and environmental communities throughout the United States and, in some limited cases, other countries. In some cases, the SAB also accesses experts via the route of Federal Expert and Invited Expert. These categories are described in greater detail in Appendix C5, "Types of Affiliation with the SAB."

The number of Members is flexible. In FY 2000, SAB consisted of 104 members appointed by the Administrator for two-year teams. Service as Committee Chair can lead to as much as an additional four years of continuous service. A formal guideline on Membership service was adopted by the Executive Committee in FY 1993 and has been followed by the Administrator in making appointments (see Appendix C4).

More than 300 technical experts, invited by the Staff Director, serve on an "as needed" basis as Consultants to the Board on various issues where their expertise is relevant. The number of Consultants is flexible, and their one-year terms can be renewed indefinitely. Consultants are required to meet the same standards of technical expertise as do the Members. In FY 2000, the SAB utilized the services of 90 Consultants.

Appendices C6 and C7 contain a list of the FY 2000 SAB Members and Consultants (M/C), respectively. Nearly all of them serve as Special Government Employees (SGEs), subject to all relevant Federal requirements, including compliance with the conflict of interest statutes (18 U.S.C. Section 202-209).

The activities of the 400 M/Cs are supported by the SAB Staff which, during FY 2000, consisted of 22 people: a Staff Director, a Deputy Staff Director, and the Team Leaders of the Committee Operations Staff and the Committee Evaluation and Support Staff; six scientists/engineers who serve as Designated Federal Officers (DFOs), three administrative staff, five support staff, one detailee, two interns, and a National Older Worker's Career Center (NOWCC) Office Assistant (see Appendix C8 for Staff Biographies and Staff Transitions).

The SAB Staff works with the Agency to identify potential issues for SAB attention, focuses questions for review, works with the Board to identify and enlist appropriate Members and Consultants, interfaces between the Board and the Agency as well as with the public, coordinates logistics for reviews, and produces minutes and reports for submission to the Administrator.

1.3 SAB ACTIVITIES

As shown in Table 1, the SAB's budget in FY 2000 totaled more than $2.7 million. Table II and Table III show that these resources enabled the Board to conduct 55 meetings and to issue 37 reports (see Appendices B1 - B4). The increase in total costs over the years reflects an increase in the number of Board Members, increases in Federal pay and allowances, and general increases in the cost of airline travel, hotel and meeting accommodations.

The types of projects, as well as the range of subject matter, reviewed by the SAB continue to grow. The Board takes on reviews at the request of Congress, the Administrator, and EPA's various program offices, as well as on its own initiative. In general, the trend over time has been for more SAB reviews, addressing more varied subjects, requested by a wider range of individuals and organizations.

SAB reports most often present the findings of peer reviews of nearly-completed Agency projects and contain considerable detail about the findings and recommendations of the Board. They are generally structured as responses to a formal Charge to the Board. The Charge is a set of specific questions, negotiated by the Agency and the SAB that guide, but do not constrain, the review.

In recent years the SAB has worked with the Agency to produce more timely advice that is focused at the front-end of the Agency's involvement with an issue. First, the Board developed the "Consultation" as a means of conferring, as a group of knowledgeable individuals, in public session with the Agency on a technical matter, before the Agency has begun substantive work on that issue. The goal is to leaven EPA's thinking by brainstorming a variety of approaches to the problem very early in the development process. There is no attempt or intent to express an SAB consensus or to generate a formal SAB position. The Board, via a brief letter, simply notifies the Administrator that a Consultation has taken place.

Second, "Letter" reports are similar in origin, content, and purpose to full reports. They are simply shorter; thereby generally resulting in more rapid advice to the Agency.

Third, the Board introduced the "Advisory" as a means of providing, via a formal SAB consensus report, critical input on technical issues during the Agency's position development process. In most instances, the topic of the Advisory will later be the subject of an SAB report, once the Agency has completed its work.

Fourth, the "Commentary" is a short communication that provides unsolicited SAB advice about a technical issue the Board feels should be drawn to the Administrator's attention.

Appendix B2 details meeting activity and report preparation by Committee.

1.4 CONTENT OF THE REPORT

Tables I , II and III display the SAB's operating expenses, meeting activity, report production, and staffing for the past five fiscal years (1996-2000).

This Report consists of four principal sections, plus appendices supplementing the

discussion in the main sections. Following this Introduction (Section 1), Section 2 summarizes the Board's highlights of the year, Section 3 focuses on SAB Committee activities during FY 2000, and Section 4 provides the Board's plans for the future.

The Appendices contain important information, such as organizational charts, membership lists, abstracts of SAB reports, and other information.

Figure 2. SAB's Estimated Expenses ($K) for Fiscal Year 2000

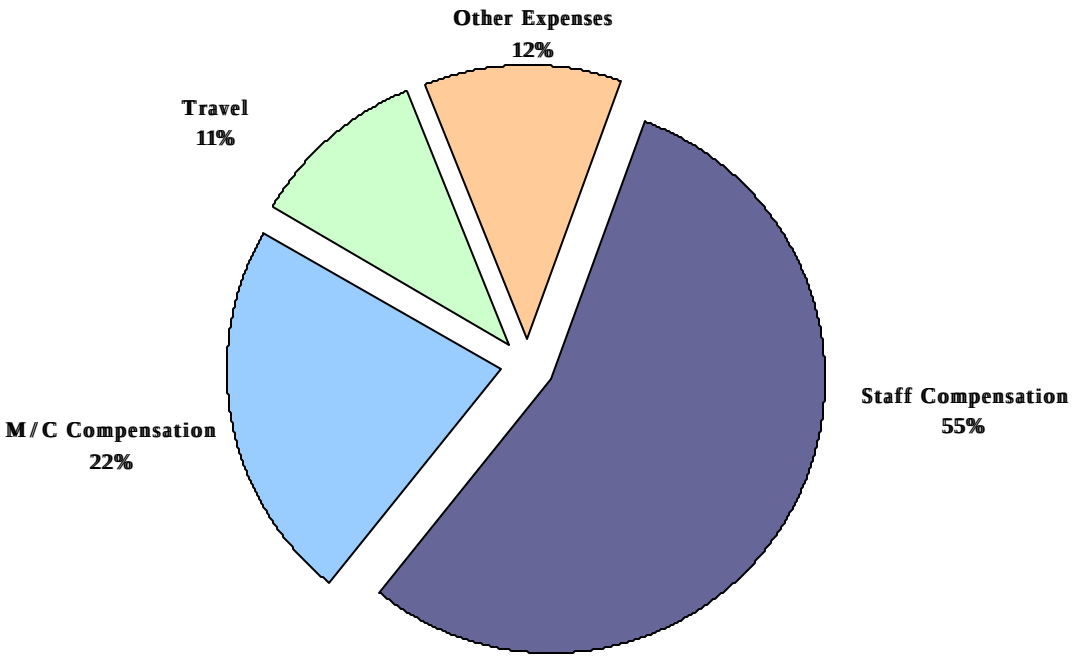


Table 1
Budget Totals for Fiscal Years 1996 - 2000*
(In thousands of dollars)

Fiscal Year	Staff Compensation	M/C Compensation	Total	Travel	Other Expenses	Total
1996	1,045	392	1,437	242	88	1,768
1997	1,170	555	1,725	282	212	2,219
1998	1,250	600	1,850	285	281	2,416
1999	1,318	630	1,948	308	298	2,554
2000*	1,488	603	2,091	290	312	2,693

***Estimated**

Figure 3. SAB Activities for Fiscal Year 2000

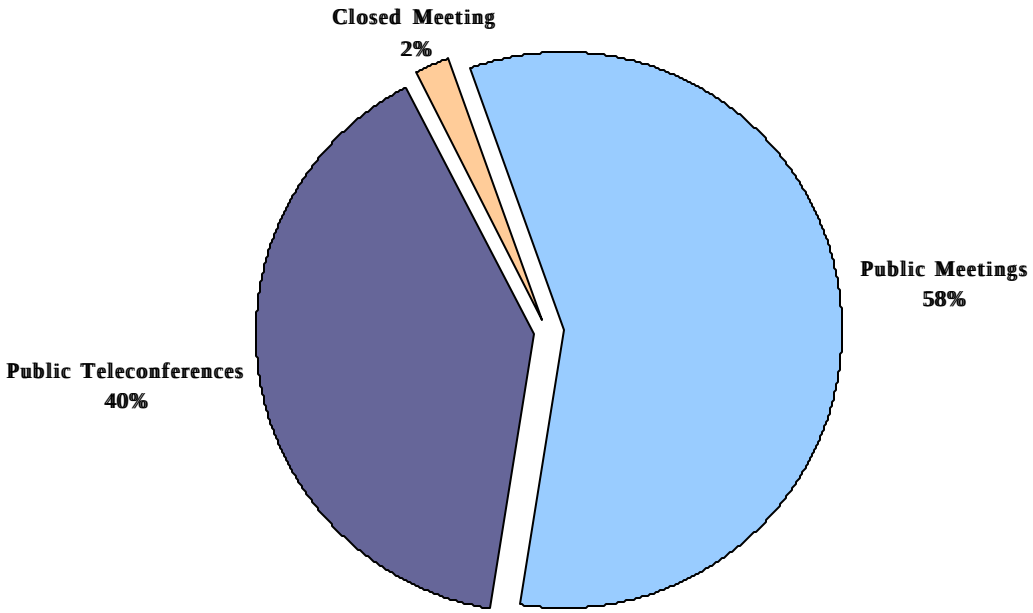


Table II
SAB Activities for Fiscal Years 1996 - 2000

Fiscal Year	Public Meeting	Public Teleconference	Closed Meeting	Total
1996	28	9	0	37
1997	34	21	1	56
1998	42	8	1	51
1999	33	14	1	48
2000	32	22	1	55

Figure 4. Committee Reports for Fiscal Years 1996 - 2000

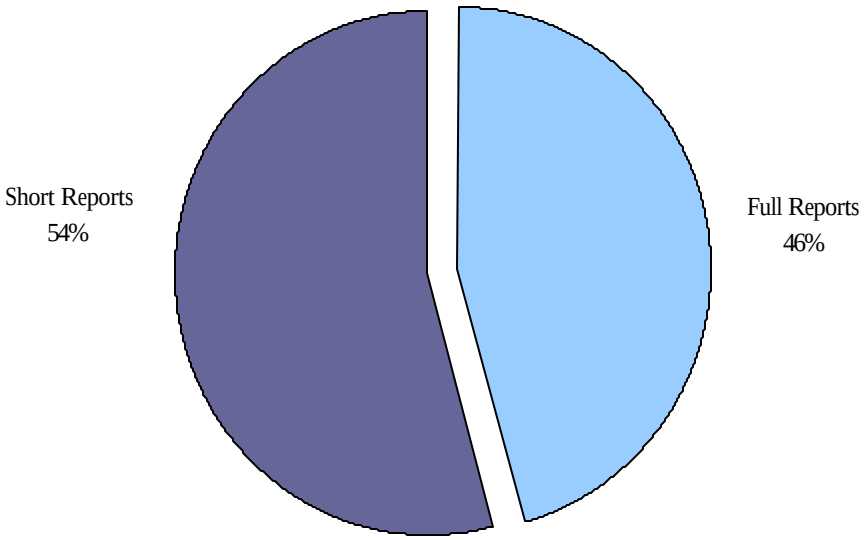


Table III
Committee Reports and Staffing for Fiscal Years 1996 - 2000

	Committee Reports				Staffing	
Fiscal Years	**Full Reports**	**Short Reports**	**Total**	**Notifications of Consultations**	**Members**	**Federal Staff**
1996	3	17	20	2	98	16.7
1997	11	18	29	2	97	17.6
1998	11	10	21	9	102	19.7
1999	19	21	40	8	105	19.7
2000	17	20	37	8	104	18.8

2.0 MAJOR HIGHLIGHTS OF THE YEAR: MAKING SCIENCE "REAL"

In order to help make science "real" (that is, effective in the environmental decision-making context), the SAB needs to address the appropriate issues in the appropriate way at the appropriate time. With limited resources, the Board cannot examine all of the technical issues confronting the Agency nor pursue all of the areas in which its Members believe that they could provide valuable advice. Therefore, it is important that the Board work with the Agency and other interested and affected parties in order to select those issues best suited for SAB consideration, referring the remainder to other mechanisms available for peer involvement and peer review.

As the Board addresses an agenda of more consistently high-profile issues, it is not surprising that its activities come under greater scrutiny. In FY 2000 this attention included keen interest from Congress and from the courts, both of whom were interested in making science real in the Agency's decision-making process.

The Board also reached out in new ways to make science more real and more relevant. These efforts included involving social sciences more directly in SAB activities, co-sponsoring workshops, coordinating with other FACA committees inside and outside the Agency, and broadening the use of more powerful tools that are becoming available through the Internet.

2.1 CONDUCTING PROJECTS THAT MAKE SCIENCE REAL

2.1.1 *TOWARD INTEGRATED ENVIRONMENTAL DECISION-MAKING*

In FY 2000, the Board completed work on the longest, most complex project that it has ever undertaken. When originally asked by the Deputy Administrator in 1995 to update its 1990 unprecedented *Reducing Risk* report, the SAB soon realized that the job would entail more than a simple updating of a decade-old report. Instead, in their view, the job required a broader realization of the problems that would confront the Agency in the 21st Century and a correspondingly broader thinking, including considerations of economics and other social sciences, as well as traditional risk assessment and risk management concerns. Therefore, the Board enlisted a group of over 50 experts to explore five aspects of environmental decision-making:

(a) ecological risk assessment
(b) health risk assessment
(c) risk reduction options
(d) cost-benefit and economics
(e) special ecological valuation issues

The result of these efforts has been a succinct, peer-reviewed report that encourages many of the new directions with which the Agency is already experimenting; e.g., Project XL, the Common Sense Initiative, and other activities coordinated through the Office of Reinvention. The SAB report goes further to

present a view of an entirely integrated environmental decision-making process, ranging from problem identification/formulation, through comparative risk assessment procedures and cost-benefit analysis, to analysis of risk reduction options and evaluation of regulatory decisions.

The efforts of the Subcommittees and Steering Committee have spawned an assortment of followup efforts, among them being the following:

(a) Preparation of an article for the peer-reviewed literature that assesses and compares ecological risks.

(b) Transfer to the Agency of a procedure for gauging comparative risk judgments via the Internet.

(c) Development by the EEC of a companion, but stand-alone, report on options for risk reduction.

(d) Preparation by the EPEC of a companion, but stand-alone, report that provides a framework for the much-discussed environmental report cards.

(e) Joint sponsorship with the Agency of a workshop to explore public values and attitudes towards ecological risk management.

In short, in *Toward Integrated Environmental Decision-making*, the Board has addressed a complex topic and points the Agency in a direction to make the relevant science more real.

2.1.2 MOVING BEYOND STRICTLY PEER REVIEW ISSUES

For most of its 20-year history, the SAB has been viewed and used as the Agency's premier peer review organization. In recent years, the Agency has introduced an aggressive peer review policy (EPA's Peer Review Policy, June 7, 1994), along with mechanisms to implement that policy (EPA's Peer Review Handbook, January, 1998). Therefore, while not neglecting its responsibility to be the "peer-reviewer-of-choice" for particularly prominent or contentious issues, the Board can now explore some of the broader issues of scientific and technical advice that were in the minds of those who first conceived of the idea of the SAB (Ref: Congressman George Brown, personal communication to Dr. Barnes).

For example, in FY 2000 the Board examined the issue of assessing benefits from environmental protection. This issue has arisen during various SAB activities in recent years; including those of the Council, the EEAC, and the *Toward Integrated Environmental Decision-making* project. As a result, the Board has worked with the Agency to plan and conduct workshops that are aimed at various aspects/contexts of this issue; i.e.,

(a) SAB/EPA Workshop on the Benefits of Reductions in Exposure to Hazardous Air Pollutants: Developing Best Estimates of Dose-Response Functions.

(b) SAB/EPA Workshop on Understanding Public Values and Attitudes Regarding Ecological Risk Management.

Also, based on its interactions with a number of Agency programs over the years, EPEC concluded that there is a need for a consistent, ecologically based framework for assessing and reporting on the state of ecological resources, whether at the national, regional or other scale. Therefore, in FY 2000, EPEC picked up on ideas stemming from the Board's *Toward Integrated Environmental Decision-making* project, as well as activities by groups outside the Agency (e.g., Heinz Center, National Research Council, inter alia) and undertook a self-initiated project to develop a framework for reporting on ecological change. The project, which will continue into FY 2001, will generate an organizing framework that should be useful in

(a) Evaluating the completeness and usefulness of proposals to assess and characterize ecological conditions.

(b) Conveying ecological status and trends information to decision-makers and the public; i.e., making the information "real" to the people who need to know.

To date, the Committee has been briefed on a variety of EPA environmental reporting efforts, as well as the U.S. Forest Service's Forest Health Monitoring program. In addition, they have surveyed a variety of ecological indicator reporting schemes, considered the needs of the Agency to report on environmental conditions and progress toward environmental goals, and selected a set of essential ecological attributes that should be included in environmental reporting schemes, including those devised to report on Government Performance and Results Act (GPRA) goals. The draft reporting categories are as follows:

(a) Landscape structure
(b) Biotic condition
(c) Physical/chemical characteristics
(d) Hydrology/geomorphology
(e) Ecological processes
(f) Natural disturbance regimes.

The Committee's final report will discuss these six essential ecological attributes and use case examples to illustrate potential applications of the reporting framework for EPA programs and projects. Such applications will include use of the framework to assess whether assessment information is comprehensive, and to organize information on ecological conditions in a way that is understandable to decision-makers and the public.

The goal is to provide the Agency with a robust tool that can be used to assess and test any of the several different measures of ecological health that are under development both inside and outside the EPA, thereby making ecological science "real" in the Agency's context.

2.2 MAKING SCIENCE REAL IN THE CONGRESSIONAL ARENA

By law, the SAB advises the Congress of the United States, as well as the Administrator of EPA. Congress, in setting its broad approaches to policy, often bases its actions on what it refers to as "sound science", in contrast to what some derisively refer to as "junk science." The former is characterized by broad consensus in the scientific community and positions supported by peer-reviewed publications; while the latter is variously characterized as "unproven", "overly

conservative", and/or "based on weak theory, rather than solid fact." While these characterizations can be debated interminably, it is encouraging that Congress reaches out to the scientific community, including specifically the SAB, for input when making decisions.

The SAB is seen by many in Congress as a source of independent, balanced advice on controversial issues. Sometimes the Congress asks the Board to respond directly to its concerns. In those cases, Board Members testify before the Congress on the results of some of the studies/reviews that it has done, thereby putting a real face on a real issue in real time. During FY 2000, Members of the Board presented testimony on two separate occasions.

First, in March, Dr. William Randall Seeker, Chair of the Research Strategies Advisory Committee, testified before the Energy and Environmental Subcommittee of the House Science Committee regarding the President's budget request for science at the Agency during FY 2001. In his testimony, Dr. Seeker summarized RSAC's review of the issue (EPA-SAB-RSAC-00-007) and answered questions of the Committee members, both during the public hearing and after the session.

Second, the SAB was also asked to provide testimony before the Subcommittee on Superfund, Waste, and Risk Assessment of the Senate Environment and Public Works Committee. The topics discussed included a) comparative risk assessment and b) the "residual risk" program, called for under the Clean Air Act Amendments of 1990. Dr. Morton Lippmann, Interim EC Chair, prepared written testimony that told the Congressmen of the importance of comparative risk assessment (cf. *Reducing Risk* EPA-SAB-EC-90-007) and also of the difficulties of the task, given the differences in the information available on different chemical stressors. Dr. Phil Hopke, Chair of the EC Subcommittee on Residual Risk, reviewed for the Senators the Subcommittee's work on residual risks of lead smelters that led to an FY 2000 Report (EPA-SAB-EC-ADV-00-005) and Commentary (EPA-SAB-EC-COM-00-005). His message, while encouraging, highlighted the need for either more resources devoted to the task or a reassessment as to what could and should be reasonably expected and required of science in this program.

Also, in the Appropriations bill for FY 2000, the Congress directed the Agency to conduct a study of the impact of the pilot program on the Agency's Integrated Risk Information System (IRIS). Further, the SAB was identified as the group to provide oversight and review of the study. As a consequence in March 2000, the EC held a Consultation on the IRIS pilot program and its study design. Following review of the results of the study, the Board concluded that the Agency had done a credible study and forwarded their findings and recommendations to the Agency and to the Congress (EPA-SAB-EHC-00-003).

2.3 MAKING SCIENCE REAL BY EXPANDING METHODS OF OUTREACH

The best science in the world will not have an impact unless and until people are aware of what that science is and what that science says. Therefore, in FY 2000

the SAB expanded the methods by which its Committees give advice and make that advice known to a wider audience.

2.3.1 SOCIAL SCIENCES

In recent years, the Board has emphasized the importance of the field of social sciences in environmental decision-making. To demonstrate and expand upon that importance, the Board added a social scientist as an at-large member of the Executive Committee. Dr. Roger Kasperson of the Stockholm Institute has been both engaged and provocative in this role, to the point that the Executive Committee is exploring the possibility of and need for a separate committee to address issues focused on the social sciences.

In addition, the Board initiated a seminar series -- Science and the Human Side of Environmental Protection -- that brings some of the leading social scientists in the country to the Agency, each delivering an address on how that field has made an impact on resolving environmental issues and how it can help resolve ones in the future. The list of speakers and topics for FY 2000 is found in Section 3.1.2 and abstracts of the seminars are found in Appendix B7. These seminars have been well-attended and well-structured, with a high-ranking Agency official present to act as a lead discussant following each presentation.

2.3.2 SAB/AGENCY WORKSHOPS

The Board introduced another new mechanism this year for providing advice: the SAB/Agency Workshop. The Agency is faced with several large issues of such complexity/controversy that EPA has not worked out proposed approaches to deal with them. Often the situation calls for a gathering together of interested and informed parties to discuss the issue at length and to explore possible alternative approaches to address the topic. In FY 2000 the Board joined with the Agency to plan or co-sponsor five workshops, addressing complex/ controversial topics (See Section 3.1.2 and 3.7.1). In each case, a joint SAB/Agency Planning Group met design and structure the conclave. The goal of these public workshops is to define the issue, seek common understanding of the problem, and consider various options for resolution. In one case, the workshop resulted in a Commentary on "The Diffusion and Adaptions of Innovations in Environmental Protection" that will be completed in FY 2001. The general expectation is that the Agency will use this information to develop specific positions that may well come back to individual SAB Committees as subjects for an Advisory or a Report.

2.3.3 INCREASED INTERACTION WITH OTHER FACA COMMITTEES

The SAB has long sought interaction with other technically related Federal Advisory Committee Act (FACA) committees. By involving technical experts from different FACA Committees who might have different perspectives on an issue, the Board believes that it can provide more complete, more well-rounded advice that would otherwise be possible. This broader perspective should be of greater value to the Agency than that which would be provided by a review from a single

committee alone, as EPA seeks to utilize such advice in the real world.

As one example, the Chair of the FIFRA Scientific Advisory Panel (SAP) has been an invitee to SAB Executive Committee meetings for several years. Dr. Ernest McConnell was followed by Dr Ronald Kendall as SAP chair in FY 2000. Also, SAP members are always involved when the SAB conducts a review of the Agency's risk assessment guidelines, which are applied to pesticides and non-pesticides alike. In an extension of their cooperation, this year the SAB and SAP formally conducted a joint review of the Agency's handling of data resulting from the testing of human subjects. This particularly controversial review revealed a number of areas that will improve future interactions between the FACA committees.

This year we saw the continued active involvement of the Chair of the Board of Scientific Counselors (BOSC) in meetings of the SAB Executive Committee. The BOSC is the FACA Committee that advises the Assistant Administrator for the Office of Research and Development on technical aspects of the operations of that office. Outgoing Chair, Dr. Costel Denson of the University of Delaware, was a consistent and valued contributor to the Board's deliberations. The incoming Chair, Dr. Jerry Schnoor of the University of Iowa, has indicated a similar level of interest. FY 2000 also saw completion of the first joint SAB/BOSC review: Review of the Science to Achieve Results Program (EPA-SAB-EC-008).

In an extension of inter-FACA cooperation, the Executive Committee welcomed the presence of a representative of the Children's Health Protection Advisory Committee (CHPAC), a FACA established to advise the Agency's Office of Children's Health Protection (OCHP). Mr. Thomas Carrato of Monsanto Corporation, served ably in that capacity. He will be replaced by Dr. Joel Bender, American Chemistry Council, in FY 2001.

Throughout FY 2001 Dr. Richard Bull, Chair of the DWC, was a regular attendee at meetings of the Disinfection/Disinfection Byproducts FACA operated by the Office of Water. His attendance was the SAB's attempt to be close to the negotiations in order to identify any technical issues that would benefit from SAB involvement, while not being a party to the negotiations themselves. This exercise kept the DWC fully informed of developments at a modest cost in terms of resources. The process also demonstrated that, in this case, procedures could be utilized to effectively address technical issues without the SAB being directly involved in the details.

The inter-FACA connection of the DWC was further enhanced by extensive activity of Dr. L.D. McMullen, who served both as a Member of the DWC and as Chair of the National Drinking Water Advisory Committee (NDWAC).

The RAC began preparations to review, in the coming fiscal year, the Multi-Agency Radiation and Laboratory Analytical Protocols (MARLAP), that is the product of an interagency team of technical staff from the Department of Defense, the Department of Energy, the Nuclear Regulatory Commission, and the US Geological Survey (USGS), as well as the Agency. We anticipate that the MARLAP review will mirror the successful

review of a related inter-agency effort, (Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) in September, 1997. The Board anticipates reaching out to other agencies and their appropriate FACA committees for input, insights, and possibly deeper involvement during the review process.

Finally, the OSAB has been heavily involved in planning the first meeting of all Agency FACA Chairs, slated for early FY 2001. The goal is to broaden the Chairs mutual understanding of the total FACA community and to seek ways to work together to enhance the impact and effectiveness of their advice.

In short, the Board has pursued a number of approaches to reach out to other FACA committees, both inside and outside the Agency, in order to broaden the base -- and hence the utility -- of the advice to the Agency on a range of technical issues. The goal is to make scientific facts "real" in a real world context.

2.3.4 ENHANCED USE OF THE E-WORLD

It is a well-known fact that the Internet is changing the way we live and operate. This truism holds for the SAB as well. The SAB's monthly newsletter -- *Happenings at the SAB* -- entered its 6th continuous year of production in FY 2000 (Earlier editions were a periodically produced as early as 1989). Originally produced as "hardcopy", it was sent by mail to some 400 interested and affected parties. Two years ago, production shifted to the email, whereby distribution of the newsletter was via the fast-becoming-standard distribution mode of the electronic age. While email had many advantages for both the SAB Staff and the *Happenings* readership, we encountered numerous compatibility and interface problems that were distressing to both the sender and the receiver. (In some cases, subscribers canceled their free subscriptions, judging that the inconvenience was not worth the trouble.) This year, we simplified the process even further by sending a short email message, announcing the availability of the new issue of the newsletter and providing a hotlink to the SAB Website where the new issue was featured prominently, along with back issues for the last six months. This approach has been well-received by a hard-working staff and busy clientele of *Happenings* readers.

The SAB website itself (www.epa.gov/sab) underwent the second facelift of its short life. The layout is now into conformance with Agency standards, and there is a system to maintain the currency of the information. Given the continuing, rapid evolution of the Internet, we anticipate the need for further improvements in our Website in FY 2001.

The SAB staff spent considerable time and effort systematically building an integrated database that will facilitate its collection, handling, and analysis of data related to people: Members, Consultants, Membership, Nominations, Staff, etc. This "People DataBase (PD1)" system replaces several stand-alone databases that have served the office well -- but at considerable cost of labor, currency, and accuracy. The goal for FY 2001 is to complete enhancements on PD1 and begin development of a "Products DataBase (PD2)" to facilitate handling of our more than 600 SAB reports and background papers that have been generated

over the years.

In part, as a result of problems uncovered during one of the Board's reviews, the SAB Staff developed an Internet-based SAB "Discussion DataBase (DDB)" that allows Panel members working on an SAB report to have ready access -- in a "firewall-protected environment" -- to background documents, drafts, and one another's comments on drafts. The goal is to have a system of report preparation that is more rapid and more fully informs the participants during the preparation process. Introduction of the system during the winter was halted when the security system of the entire Agency computer system was called into question. At the close of the fiscal year, the DDB system came back on line. That is, it is becoming "real" again.

3.0 FY 2000 COMMITTEE ACTIVITIES

The main activity of the SAB are the projects undertaken by its various Committees. In the face of more requests than current resources can address, the Board has had to be selective about its choice of projects. In selecting projects, the SAB has generally been guided by criteria that were originally generated in a "self study" retreat in 1989 and updated at a Strategic Planning Retreat of the Executive Committee in 1997. Provided below is a list of the SAB criteria.

1. General Criterion

a. Provides an opportunity to make a difference in Agency Operations.

2. Client-related Criteria

a. Supports major regulatory or risk management initiatives.
b. Serves leadership interest such as those of the EPA Administrator or Congress.
c. Support strategic themes of current interest.

3. Science-driven Criteria

a. Involves scientific approaches that are new to the Agency.
b. Deal with areas of substantial uncertainty.

4. Problem-driven Criteria

a. Involves major environmental risks
b. Relates to emerging environmental issues
c. Exhibits long-term outlook

5. Organizational-related Criteria

a. Serves as a model for future Agency methods.
b. Requires the commitment of substantial resources to scientific or technological development.
c. Transcends organizational boundaries, within or outside EPA (includes international boundaries).
d. Strengthens the Agency's basic capability.

3.1 EXECUTIVE COMMITTEE (EC)

EC Members

Chair: Dr. Joan Daisey, Lawrence Berkeley National Laboratory*
Interim Chair: Dr. Morton Lippmann, New York University

Dr. Henry Anderson
Wisconsin Department of Health & Family Services
Dr. Richard Bull
MoBull Consulting
Dr. Maureen Cropper
The World Bank
Dr. Kenneth Cummins
Humboldt University
Dr. Linda Greer
Natural Resources Defense Council
Dr. Hilary Inyang
University of Massachusetts@Lowell
Dr. Janet Johnson
Shepherd Miller, Inc.
Dr. Roger Kasperson
Clark University
Dr. Joe L. Mauderly
Lovelace Respiratory Research Institute
Dr. M. Granger Morgan
Carnegie Mellon University
Dr. W. Randall Seeker
General Electric Energy & Environmental Research Corporation
Dr. William H. Smith
Yale University
Dr. Robert N. Stavins
Harvard University
Dr. Mark Utell
University of Rochester
Dr. Terry Young
Environmental Defense

*deceased February 2000

Liaison from Other FACA Committees

Board of Scientific Counselors
Dr. Costel Denson (term expired Spring, 2000)
University of Delaware
Dr Gerald Schnoor (term began Spring, 2000)
University of Iowa

FIFRA Scientific Advisory Panel
Dr. Ronald Kendall
Texas Tech University

Children's Health Protection Advisory Committee
Mr. Thomas Carrato
Monsato Company

3.1.1 BACKGROUND

The EC coordinates the work of 10 standing Committees and numerous ad hoc subcommittees. The EC had 8 active subcommittees during the year.

(a) Air Toxics Monitoring Strategy Subcommittee
Chair: Dr. Thomas McKone, University of California

(b) Chloroform Subcommittee
Co-Chairs: Dr. Richard Bull, Battelle Northwest
Dr. Mark Utell, University of Rochester Medical Center

(c) Environmental Models Subcommittee--Total Risk Integrated Methodology (TRIM)
Chair: Dr. Mitchell Small, Carnegie Mellon University

(d) Residual Risk Subcommittee–Secondary Lead Smelters
Chair: Dr. Philip Hopke, Clarkson University

(e) Scientific and Technological Achievement Awards (STAA) Subcommittee
Chair: Dr. H. C. Ward, Rice University

(f) Science to Achieve Results (STAR) Review Subcommittee
Co-chairs: Dr. W. Randall Seeker, General Electric--SAB
Dr. Marilyn Brown, Oak Ridge National Laboratory- -BOSC

(g) *Toward Integrated Environmental Decision-Making* Review Subcommittee
Chair: Dr. Granger Morgan, Carnegie-Mellon University

(h) Use of Data from the Testing of Human Subjects Subcommittee
Co-Chairs: Dr. Ron Kendall, Texas Tech University

Dr. Mark Utell, University of Rochester Medical Center

Each of these subcommittees met once, for a total of 8 subcommittee face-to-face meetings, plus 1conference call. In these activities, the EC utilized the services of 38 Consultants.

With a Membership consisting of the Chairs of the standing Committees and three At-large Members, this FACA-chartered institution is the nerve center of SAB activity, reviewing reports from the standing Committees (with the exception of reports from the separately chartered CASAC and Council), discussing proposals from standing Committees, and directing the work of a growing number of ad hoc subcommittees that address complex issues calling for multi-disciplinary expertise.

3.1.2 ACTIVITIES

In FY2000, the EC met 3 times in face-to-face meetings and 7 times via publicly accessible conference calls. Its subcommittees collectively met 8 times and 1 time by publicly accessible conference call. In these activities, the EC utilized the services of 31 Consultants.

In addition, the EC authorized the establishment of an SAB lecture series, "Science and the Human Side of Environmental Protection"(see Section B7 for details), held at the Agency. The first year program consisted of the following noted speakers:

(a) Dr. Gary Machlis, University of Idaho

"The 7% Solution"

(b) Dr. Eugene Rosa, Washington State University
"Programming Your VCR and Other Technology Choices"

(c) Dr. Baruch Fischhoff, Carnegie Mellon University
"Scientific Standards for Public Involvement in Environmental Decisions"

(d) Dr. Everett Rogers, University of New Mexico
"The Diffusion of Environmental Innovations"

Finally, the EC authorized the SAB Staff to conduct 4 workshops in FY2000, which were collaborative efforts with the Agency to bring new advice to the decision-makers in new ways.

(a) SAB/OAR Workshop on the Benefits of Reductions in Exposure to Hazardous Air Pollutants: Developing Best Estimates of Dose-Response Functions. June 22-23, 2000.
Report: Being developed by EPA's Office of Air and Radiation; planned to be released Winter FY 2001.

(b) Three Workshops on Science and Stakeholder Involvement. November 30, 1999; March 7, 2000; July 12, 2000.
Report: SAB Letter of Advice planned for the Spring of 2001.

3.1.3 PRODUCTS

The EC's efforts resulted in the following advice being sent to the Administrator in FY2000:

(a) An SAB Report on EPA's Per Capita Water Ingestion in the United States
(EPA-SAB-EC-00-003)

(b) An SAB/BOSC Report: Review of the Science to Achieve Results (STAR) Program of the Environmental Protection Agency
(EPA-SAB-EC-00-008)

(c) Review of the draft Chloroform Risk Assessment
(EPA-SAB-EC-00-009)

(d) Toward Integrated Environmental Decision-making
(EPA-SAB-EC-00-011)

(e) Recommendations for the 1999 Scientific and Technological Achievement Awards Program
(EPA-SAB-EC-00-014)

(f) Review of draft Air Toxics Monitoring Strategy Concept Paper
(EPA-SAB-EC-00-015)

(g) Review of the EPA's draft Revised Cancer Risk Assessment Guidelines Pertaining to Children
(EPA-SAB-EC-00-016)

(h) Comments on the Use of Data from the Testing of Human Subjects
(EPA-SAB-EC-00-017)

(i) Review of the draft Chloroform Risk Assessment and Related Issues in the Proposed Cancer Risk Assessment

Guidelines
(EPA-SAB-EC-LTR-00-001)

(j) Review of the SAB Report "Towards Integrated Environmental Decision-Making"
(EPA-SAB-EC-LTR-00-004)

(k) An SAB Advisory on the Agency's "Total Risk Integrated Methodology" (TRIM)
(EPA-SAB-EC-ADV-00-004)

(l) Advisory on the USEPA's Draft Case Study Analysis of the Residual Risk of Secondary Lead Smelters
(EPA-SAB-EC-ADV-00-005)

(m) Commentary on the Role of Science in New Approaches
(EPA-SAB-EC-COM-00-002)

(n) Commentary on the Agency's Proposed Drinking Water Standard for Radon
(EPA-SAB-EC-COM-00-003)

In addition, the EC conducted 1 consultation during FY 2000:

(a) Notification of a Consultation on the Study of the Integrated Risk Information System (IRIS)
(EPA-SAB-EC-CON-99-003)

Appendix B5 contains abstracts of these documents; complete documents are available on the SAB Website, http://www.epa.gov/sab.

3.2 ADVISORY COUNCIL ON CLEAN AIR COMPLIANCE ANALYSIS (COUNCIL)

COUNCIL Members

Chair: Dr. Maureen L. Cropper, *The World Bank*

Dr. Gardner M. Brown
University of Washington
Dr. Trudy Ann Cameron
University of California
Dr. A. Myrick Freeman
Bowdoin College
Dr. Don Fullerton
University of Texas
Dr. Lawrence H. Goulder
Stanford University
Dr. Jane V. Hall
California State University
Dr. Charles Kolstad
University of California
Dr. Lester Lave
Carnegie-Mellon University
Dr. Paul Lioy
UMDNJ-Robert Wood Johnson School of Medicine
Dr. Paulette Middleton
RAND Center for Environmental Sciences & Policy

3.2.1 BACKGROUND

The Council has its origin in the requirements of Section 812 of the Clean Act Amendments of 1990. That section mandated that a Council be established to provide independent advice on technical and economic aspects of analyses and reports that the Agency prepares concerning the impacts of the Clean Air Act on public health, the economy, and the environment of the United States.

3.2.2 ACTIVITIES

The Agency submitted the first prospective analysis to Congress in November, 1999. The analysis projected the costs and benefits of implementation of the Clean Air Act Amendments (CAAA) over the period 1990-2010. The Council and its subcommittees provided the Administrator with 3 letters offering advice to strengthen the prospective analysis in FY2000. The Council conducted 2 publicly accessible teleconferences.

The Committee used 1 Consultant in FY2000.

3.2.3 PRODUCTS

The Council generated the following Advisories in FY2000:

(a) The Clean Air Amendments (CAAA) Section 812 Prospective Study of Costs and Benefits (1999): Advisory by the Health and Ecological Effects Subcommittee on Initial Assessments of Health and Ecological Effects; Part 2 (EPA-SAB-COUNCIL-ADV-00-001)

(b) The Clean Air Amendments (CAAA) Section 812 Prospective Study of Costs and Benefits (1999): Advisory by the Advisory Council on Clean Air Compliance Analysis: Costs and Benefits of the CAAA (EPA-SAB-COUNCIL-ADV-00-002)

(c) Final Advisory on the 1999 Prospective Study of Costs and Benefits (1999) of Implementation of the Clean Air Act Amendments (CAAA) (EPA-SAB-COUNCIL-ADV-00-003).

Appendix B5 contains abstracts of these documents; complete documents are available on the SAB Website, http://www.epa.gov/sab.

3.3 CLEAN AIR SCIENTIFIC ADVISORY COMMITTEE (CASAC)

CASAC Members

Chair: Dr. Joe Mauderly, Lovelace Respiratory Research Institute

Dr. John Elston
New Jersey Department of Environmental Protection
Dr. Philip Hopke
Clarkson University
Dr. Eva Pell
Pennsylvania State University
Dr. Arthur Upton
UMDNJ-Robert Wood Johnson Medical School
Dr. Sverre Vedal
University of British Columbia
Dr. Warren White
Washington University

3.3.1 BACKGROUND

The CASAC is a separately chartered Federal advisory committee that is administratively housed within the offices of the SAB. As an independent advisory committee, however, the Committee reports directly to the EPA Administrator. The Chair of CASAC serves as a Member of the SAB Executive Committee, and the Members of CASAC are also Members of the SAB.

The CASAC has a statutorily mandated responsibility (under the 1977 and 1990 Clean Air Act Amendments) to review and offer scientific and technical advice to the Administrator on the air quality criteria and regulatory documents which form the basis for the national ambient air quality standards (NAAQS). NAAQS have been established for lead, particulate matter (PM), ozone and other photochemical oxidants (O_3), carbon monoxide (CO), nitrogen oxides (NOx) and sulfur oxides (SOx). The CASAC process includes a peer review of the Office of Research and Development's Air Quality Criteria Document for a given NAAQS, followed by peer review of the Office of Air and Radiation's Staff Paper for that NAAQS. The Criteria Document contains all the relevant scientific and technical information on the pollutant, while the staff paper is the bridge between the science in the criteria document and the policy decision that has to be made by the EPA Administrator. When asked by EPA, the Committee also reviews the scientific and technical issues in the regulatory proposal for a NAAQS prior to its promulgation. The Committee also offers research recommendations for individual NAAQS pollutants on a periodic basis, often in conjunction with a review of the Agency's Strategic Research Plan for that pollutant.

3.3.2 ACTIVITIES

The CASAC met 5 times during FY2000--3 face-to-face meetings and 2 publicly accessible conference calls. In addition, the CASAC Subcommittee on Fine Particle Monitoring held two meetings--1 face-to-face and 1 by publicly accessible conference

call. A total of 29 Consultants participated in CASAC activities during the year.

More detailed information on CASAC NAAQS-specific activities are found in Appendix B3.

3.3.3 PRODUCTS

The CASAC issued the following reports during FY2000

(a) Review of EPA's Health Assessment Document for Diesel Emissions (EPA-SAB-CASAC-00-004)

(b)Advisory on the $PM_{2.5}$ Monitoring Network (EPA-SAB-CASAC-ADV-00-006)

(c) Review of the Air Quality Criteria for Carbon Monoxide (EPA-SAB-CASAC-LTR-00-002)

(d) Review of the Draft Air Quality Criteria Document for Particulate Matter (EPA-SAB-CASAC-LTR-00-003)

(e) Review of the EPA Response to Section 6102 (e) of the Transportation Equity Act for the 21st Century (EPA-SAB-CASAC-LTR-00-006)

and Notifications of Consultations during FY 2000:

(a) Consultation on the Development of the Carbon Monoxide Staff Paper (EPA-SAB-CASAC-CON-00-001)

(b) Consultation on the Development of the Particulate Matter Staff Paper (EPA-SAB-CASAC-CON-00-004)

(c) Consultation on Thermal Carbon Analysis (EPA-SAB-CASAC-CON-00-006)

(d) Consultation on Sampler Intercomparison Study (EPA-SAB-CASAC-CON-00-007)

Appendix B5 contains abstracts of these documents; complete documents are available on the SAB Website, http://www.epa.gov/sab.

3.4 DRINKING WATER COMMITTEE (DWC)

DWC Members

Chair: Dr. Richard Bull, Battelle Pacific Northwest National Laboratory

Dr. David Baker
Heidelberg College
Dr. Mary Davis
West Virginia University
Dr. Ricardo DeLeon
Metropolitan Water District of Southern California
Dr. Yvonne Dragan
Ohio State University
Dr. John Evans
Harvard University
Dr. Barbara Harper
Yakama Indian Nation
Dr. L.D. McMullen
Des Moines Water Works
Dr. Christine Moe
University of North Carolina
Dr. Charles O'Melia
Johns Hopkins University
Dr. Gary Toranzos
University of Puerto Rico
Dr. Rhodes Trussell
Montgomery Watson Consulting Engineers

3.4.1 BACKGROUND

The DWC provides independent advice and peer reviews to EPA's Administrator on the technical aspects of problems and issues associated with the drinking water program, including the research that supports the program. Consequently, the primary clients for the Committee are EPA's Office of Water and the Office of Research and Development.

The importance of SAB interactions with the Agency was reinforced in the Safe Drinking Water Act Amendments which requires consultation with the SAB on many Drinking Water actions. Specifically, that Act states at Section 1412(e) that:

"The Administrator shall request comments from the Science Advisory Board (established under the Environmental Research, Development, and Demonstration Act of 1978) prior to proposal of a maximum contaminant level goal and national primary drinking water regulation. The Board shall respond, as it deems appropriate, within the time period applicable for promulgation of the national primary drinking water standard concerned. This subsection shall, under no circumstances, be used to delay final promulgation of any national primary drinking water standard."

3.4.2 ACTIVITIES

The DWC conducted 3 public face-to-face meetings during the year. Topics discussed during the meetings included:

(a) Proposed Long-Term 1 Surface Water Treatment/Filter Backwash Rule

(b) Proposed Ground Water Rule

(c) Contaminant Candidate List Research Plan

(d) Non-Radon Radionuclides

(e) Proposed Radon Drinking Water Standard

(f) Proposed Arsenic Drinking Water Standard

(g) Stage 2 Microbial/Disinfection Byproducts Stakeholder Proceedings

A total of 5 Consultants were involved in these activities.

3.4.3 PRODUCTS

These efforts resulted in the following advice being sent to the EPA Administrator during the year:

(a) Report on EPA's Draft Proposal for the Groundwater Rule (EPA-SAB-DWC-LTR-00-005)

(b) Advisory on EPA's Draft Contaminant Candidate List (CCL) Research Plan (EPA-SAB-DWC-ADV-00-007)

(c) Commentary on EPA's Draft Proposal for a Long-Term 1 Enhanced Surface Water Treatment and Filter Backwash Rule (EPA-SAB-DWC-COM-00-004)

Appendix B5 contains abstracts of these documents; complete documents are available on the SAB Website, http://www.epa.gov/sab.

3.5 ECOLOGICAL PROCESSES AND EFFECTS COMMITTEE (EPEC)

EPEC Members

Chair: Terry Young, Environmental Defense

Dr. Miguel Acevedo
University of North Texas
Dr. William J. Adam
Kennecott Utah Copper Corporation
Dr. Lisa Alvarez-Cohen
University of California-Berkeley
Dr. Steven Bartell
Cadmus Group, Inc.
Dr. Kenneth Cummins
Humboldt State University
Dr. Cynthia Gilmour
Academy of Natural Sciences/Estuarine Research Center
Dr. Carol Johnston
University of Minnesota
Dr. Paul Montagna
University of Texas
Dr. Charles Pittinger
The Procter & Gamble Company
Dr. Leslie Real
Emory University
Dr. Frieda Taub
University of Washington

3.5.1 BACKGROUND

The EPEC is the primary committee responsible for reviews and advice relating to ecological issues, including environmental monitoring and assessment, ecological risk assessment, and ecological criteria. Traditionally, the Committee has sought to elevate the Agency's attention to non-chemical stressors (e.g., habitat issues, physical alterations of ecosystems, and introduced species) and to raise the visibility of ecological risks in an Agency often preoccupied with human health concerns.

3.5.2 ACTIVITIES

The EPEC held 2 face-to-face meetings and 1 teleconference, involving 10 Members and 5 Consultants in FY 2000. The Committee finalized work on its review of the Office of Water's proposed approaches for developing aquatic life criteria and sediment quality guidelines for metals. In addition, EPEC undertook a strategic, self-initiated project to define and illustrate the application of a framework for reporting on ecological condition. This project is more fully described in Chapter 2, Major Highlights of the Year.

3.5.3 PRODUCTS

(a) Review of an Integrated Approach to Metals Assessment in Surface Waters and Sediments
(EPA-SAB-EPEC-00-005)

(b) Review of the Biotic Ligand Model of the Acute Toxicity of Metals
(EPA-SAB-EPEC-00-006)

Appendix B5 contains abstracts of these documents; complete documents are available on

the SAB Website, http://www.epa.gov/sab.

3.6 ENVIRONMENTAL ECONOMICS ADVISORY COMMITTEE (EEAC)

EEAC Members

Chair: Dr. Robert Stavins, Harvard University

Dr. Dallas Burtraw
Resources for the Future
Dr. Trudy Cameron
University of California
Dr. Maureen Cropper
The World Bank
Dr. Herman Daly
University of Maryland
Dr. Lawrence Goulder
Stanford University
Dr. Dale Jorgenson
Massachusetts Institute of Technology
Dr. Paul Joskow
Massachusetts Institute of Technology
Dr. Catherine Kling
Iowa State University
Dr. Richard Revesz
New York University
Dr. Jason Shogren
University of Wyoming
Dr. Hilary Sigman
University of California

3.6.1 BACKGROUND

The EEAC was formed at the request of the Agency upon receipt of the Board's 1990 *Reducing Risk* report, in which the SAB cited problems that it saw in the application of economics to environmental issues. The EEAC provides advice to the Administrator on cross-cutting guidance for EPA's offices that conduct analyses of economics, cost, and benefits. The Members also advise the Agency on its economics research efforts. On occasion, the EEAC provides independent advice and peer reviews to the EPA Administrator on the technical aspects of specific economic analyses that are used in the regulatory impact analysis of proposed rulemaking and other Agency initiatives.

3.6.2 ACTIVITIES

The EEAC conducted 2 face-to-face meetings in FY2000. Topics discussed during the meetings included:

a. EPA's Economics Research Priorities
b. Induced Travel
c. Valuing Fatal Cancer Risk Reductions

A total of 3 Consultants were involved in these activities.

3.6.3 PRODUCTS

The Committee issued the following report

(a) Report on EPA's White Paper Valuing the Benefits of Fatal Cancer Risk Reduction (EPA-SAB-EEAC-00-013)

and Notification of Consultation during FY2000:

(b) Consultation on the Topic: Induced Travel: Does Additional Highway Capacity Influence Travel Demand? (EPA-SAB-EEAC-CON-00-002)

Appendix B5 contains abstracts of these documents; complete documents are available on the SAB Website, http://www.epa.gov/sab.

3.7 ENVIRONMENTAL ENGINEERING COMMITTEE (EEC)

EEC Members

Chair: Dr. Hilary Inyang, University of Massachusetts-Lowell

Dr. Ed Berkey
Concurrent Technologies Corporation

Dr. Calvin Chien
DuPont Company

Dr. Barry Dellinger
Louisiana State University

Dr. Terry Foecke
Waste Reduction Institute

Dr. Nina French
SKY+

Dr. Domenico Grasso
University of Connecticut

Dr. Byung Kim
Ford Motor Company

Dr. John Maney
Environmental Measurement Assessments

Dr. Michael McFarland
Utah State University

3.7.1 BACKGROUND

The EEC is one of the original five SAB committees. There was clear recognition from the earliest days of the Agency that EPA can benefit from advice on what can be done to alleviate problems (i.e., reduce risk), as well as to identify problems (i.e., risk assessment). The interests/responsibilities of this interdisciplinary Committee, anchored by the presence and leadership of environmental engineers, have grown to include such cross-Agency issues as pollution prevention, development, and implementation of the Quality System.

3.7.2 ACTIVITIES

The EEC conducted 4 face-to-face meetings and 8 publicly accessible conference calls, in addition to 3 other non-FACA interactions among Members to gather

information and/or work on drafting a report that was later reviewed in public session. The EEC used 9 consultants in FY 2000.

More detailed information on EEC activities can be found in Appendix B3.

Additionally, the EEC authorized 1 workshop in FY 2000,

a. Workshop on the Diffusion and Adoption of Innovations in Environmental Protection, conducted as an activity of the Environmental Engineering Committee. June 28, 2000.
Report: SAB Commentary under review by the Executive Committee.

3.7.3 PRODUCTS

The EEC's work resulted in the following advice being submitted to the Administrator:

(a) Review of EPA's Environmental Technology Verification Program (EPA-SAB-EEC-00-012)

(b) Improving the Efficacy of Science Advisory Board Reviews: A Study of the Attributes of Successful Technical Reviews by the Environmental Engineering Committee (EPA-SAB-EEC-COM-00-001)

(c) Commentary and Recommendations on Overcoming Barriers to Waste Utilization (EPA-SAB-EEC-COM-006)

Appendix B5 contains abstracts of these documents; complete documents are available on the SAB Website, http://www.epa.gov/sab.

3.8 ENVIRONMENTAL HEALTH COMMITTEE (EHC)

EHC Members

Chair: Dr. Mark Utell, University of Rochester

Dr. Cynthia Bearer
Case Western Reserve University
Dr. John Doull
University of Kansas
Dr. David Hoel
University of South Carolina
Dr. George Lambert
UMDNJ-Robert Wood Johnson University Hospital
Dr. Grace Lemasters
University of Cincinnati
Dr. Abby Li
Monsanto Life Sciences
Dr. Michele Medinsky
Toxicology Consultant
Dr. Roy Shore
New York University
Dr. Lauren Zeise
California Environmental Protection Agency

3.8.1 BACKGROUND

The EHC, one of the original five SAB Committees, now shares responsibilities for the review of health effects-related issues with several Committees of the Board (DWC, IHEC, RAC, and CASAC). Over the past several years, the principal focus for the EHC has been on issues related to development and use of guidelines for health risk assessments, rather than the review of agent-specific

assessments which had previously been a major activity.

The Chair and Members of EHC have been active leaders in several of the EC's ad hoc Subcommittees that have focused on a number of controversial, high-profile topics; such as, the cancer risk assessment of chloroform and the appropriate use of the data from the testing of human subjects. In the process, they have reached out to other technically-related FACA Committees in the Agency; e.g., the FIFRA Scientific Advisory Panel (SAP) and the Children's Health Protection Advisory Committee (CHPAC). Therefore, the impact of the expertise found in EHC extends far beyond the activities of the Committee, per se.

3.8.2 ACTIVITIES

The EHC conducted one face-to-face meeting during FY 2000 to review the Agency's Congressionally-mandated report on the Integrated Risk Information System (IRIS). No Consultants were used for this particular review.

3.8.3 PRODUCTS

In addition to its Members' participation in the activities and reports of other SAB Committees and Subcommittees, the EHC, per se, issued one report,

(a) Review of the Draft Report to the Congress: Characterization of Data Uncertainty and Variability in IRIS Assessments, Pre-Pilot vs Pilot/post-Pilot (EPA-SAB-EHC-LTR-00-007).

Appendix B5 contains abstracts of these documents; complete documents are available on the SAB website, http://ww.epa.gov/sab.

3.9 INTEGRATED HUMAN EXPOSURE COMMITTEE (IHEC)

IHEC Members

Chair: Dr. Henry Anderson, Wisconsin Department of Health & Family Services

Dr. Annette Guiseppi-Elie
EXXON Biomedical Sciences, Inc.
Dr. Robert Harley
University of California
Dr. Michael Jayjock
Rohm and Haas Co.
Dr. Lovell Jones
University of Texas
Dr. Michael Lebowitz
University of Arizona
Kai-Shen Liu
California Department of Health Services
Dr. Thomas McKone
University of California
Dr. Jerome Nriagu
University of Michigan
Dr. Barbara Petersen
Novigen Sciences, Inc.
Dr. David Wallinga
Natural Resources Defense Council
Dr. Charles Weschler
Telcordia Technologies

3.9.1 OVERVIEW

The Indoor Air Quality Committee (IAQC) was formed in response to Congressional recognition in the Superfund Act of 1986 that determined the actual exposure, including indoor air, of the human population to various environmental agents is a key factor in determining the nature and extent of possible health risks. In 1996, the Executive Committee gave the Integrated Human Exposure Committee(IHEC) its current name in growing recognition of the need for the Agency -- and the Board -- to consider risk factors, including exposure, in a more holistic fashion.

3.9.2 ACTIVITIES

The IHEC conducted 1 face-to-face meeting during FY2000 in order to review the Agency's draft strategy document on the analysis of data from the National Human Exposure Assessment Survey (NHEXAS). The Committee used 2 Consultants to assist them in this review.

3.9.3 PRODUCTS

In addition to the involvement of its Members in the conduct of other reviews that resulted in SAB reports to the Administrator, the IHEC submitted the following report during FY2000:

(a) Review of the Draft Strategic Plan for the Analysis of National Human Exposure Assessment Survey (NHEXAS) Pilot Study Data (EPA-SAB-IHEC-00-017).

Appendix B5 contains abstracts of these documents; complete documents are available on the SAB website, ttp://ww.epa.gov/sab.

3.10 RADIATION ADVISORY COMMITTEE

RAC Members

Chair: Dr. Janet A. Johnson, Shepherd Miller, Inc.
Past Chair: Dr. Stephen Brown, Risks of Radiation Chemical Compounds

Dr. Lynn R. Anspaugh
University of Utah
Dr. Vicki Bier
University of Wisconsin
Dr. Bruce B. Boecker
Lovelace Respiratory Research Institute
Dr. Gilles Bussod
Los Alamos National Laboratory
Dr. Thomas F. Gesell
Idaho State University
Dr. Jill Lipoti
New Jersey Department of Environmental Protection
Dr. Ellen Mangione
Colorado Department of Public Health
Dr. John Poston
Texas A&M University
Dr. Genevieve Roessler
Radiation Consultant

3.10.1 BACKGROUND

The RAC is one of the original SAB Committees. Throughout its history, the RAC has had a principal customer with the Office of Radiation and Indoor Air. Over the years, the emphasis given to radiation issues at the Agency has slackened. At the same time, there has been a great increase in the attention that the Agency gives to inter-agency aspects of radiation protection. As a consequence, EPA is actively involved in a number of joint projects with other significant players in the radiation field; e.g., the Nuclear Regulatory Commission, the Department of Energy, and the Department of Defense. The products of several of these inter-agency efforts have been jointly brought to the RAC for critical, independent peer review.

3.10.2 ACTIVITIES

In FY2000, the RAC conducted two face-to-face meetings, one publicly accessible conference call, and 3 non-FACA technical editing sessions via conference call. The Committee involved 5 Consultants in their work during the course of the year.

Among the issues addressed at these meetings were the following:

a. GENII, Version 2 (v.2), A Computer Model with Improved Capabilities for Evaluating Atmospheric Transport of Radionuclides
(SAB Project No. 00-20)

b. EPA's Proposed Approach to Evaluating

TENORM (Technologically Enhanced Naturally Occurring Radioactive Materials) Occurrence and Risks (SAB Project No. 00-21)

c. The Interagency Steering Committee on Radiation Standards' (ISCORS) Proposed Sewage Sludge Scenarios for Dose Modeling as they prepare a guidance document for sewage treatment plant operators on radioactive material in sewage sludge.

3.10.3 PRODUCTS

The RAC efforts resulted in 1 report being submitted to the EPA Administrator in FY2000:

(a) Report on the Assessment of Risks from Radon in Homes (EPA-SAB-RAC-00-10)

and one Notification of Consultation,

(a) Consultation on the Interagency Steering Committee on Radiation Standards' (ISCORS) Proposed Sewage Sludge Dose Modeling Scenarios (EPA-SAB-RAC-CON-00-008)

Appendix B5 contains abstracts of these documents; complete documents are available on the SAB website, http://ww.epa.gov/sab.

3.11 RESEARCH STRATEGIES ADVISORY COMMITTEE (RSAC)

RSAC Members

Chair: Dr. W. Randall Seeker, General Electric Energy & Environmental Research Corporation

Dr. William Adams
Kennecott Utah Copper Corporation
Dr. Richard Bull
MoBull Consulting
Dr. Stephen Brown
Risks of Radiation Chemical Compounds
Dr. Theodora Colburn
World Wildlife Fund
Dr. Philip Hopke
Clarkson University
Dr. Alan Maki
Exxon Company, USA
Dr. Genevieve Matanoski
Johns Hopkins University
Dr. Paulette Middleton
RAND Center for Environmental Sciences & Policy
Dr. Maria Morandi
University of Texas
Dr. Ishwar Murarka
Ish Inc.
Dr. William Smith
Yale University

3.11.1 BACKGROUND

The RSAC was created by the SAB at the request of the EPA Administrator in 1988. The request stemmed from the SAB's *Future Risk* report, that same year, in which the Board suggested that they could be of greater benefit to the Agency by being more closely involved with the broad strategic Agency discussions of its research role and plans.

As a result, RSAC now advises the Agency and the Congress on the overall EPA Science and Technology (S&T) Budget, as well as the Agency's overarching science programs and policies (e.g., STAR program, peer review policy, etc.). Each spring RSAC conducts a review of the President's budget request for the following fiscal year and testifies before the House Committee on Science and Technology's Subcommittee on Energy and the Environment.

An important RSAC role is to be a spokesperson for long-term science at EPA. The RSAC helps the Agency find ways to use science for its immediate and intermediate needs (i.e., "problem-driven" research) and while maintaining a credible long-term science program (i.e., "core" research).

Members of RSAC are generally those who serve or have served on other SAB Committees and have a broader perspective of research in a regulatory agency, such as EPA. As a result, RSAC Members are generally more senior (in SAB experience) than Members of other SAB committees. This arrangement insures that the Committee is familiar with EPA operations and its science needs.

3.11.2 ACTIVITIES

The RSAC conducted 1 face-to-face

meeting and 1 publically accessible teleconference in Fiscal Year 2000. There were no Consultants involved in these efforts.

In March, Dr. William Randall Seeker, the RSAC Chair, testified before the Energy and Environment Subcommittee of the House Science Committee on the RSAC review of the S&T portion of the Agency's budget.

3.11.3 PRODUCTS

The RSAC efforts resulted submitting two reports to the Administrator this year:

(a) Review of the Peer Review Program of the Environmental Protection Agency (EPA-SAB-RSAC-00-002)

(b) Review of the FY 2001 Presidential Science and Technology Budget Request for the Environmental Protection Agency (EPA-SAB-RSAC-00-007).

Appendix B5 contains abstracts of these documents; complete documents are available on the SAB website, http://ww.epa.gov/sab.

4.0 PROJECTIONS FOR THE FUTURE

The SAB enters FY 2001 with 25 new Members, including new Chairs for 3 of its Committees. As of the end of November 2000, the Administrator had not yet announced her decision regarding the new Chair of the Executive Committee. Therefore, Dr. Morton Lippmann will continue to serve in that capacity in the interim.

A major event for FY 2001 will be a Strategic Planning Retreat for the Executive Committee next spring. When Dr. Daisey assumed the Chair of the EC, one of her first acts was to preside over the first Strategic Planning Retreat in November, 1997. Now, roughly three years later and with another new EC Chair in the offing, it is appropriate to draw aside and make plans/set goals for the next four years. A number of challenges/opportunities await the new generation of SAB leadership, including the following:

(a) The evolving role of science (and SAB) in an evolving EPA.

(b) The Committee and disciplinary structure of the SAB, including social sciences

(c) The use of new technology to enhance the performance and advice of the Board.

The SAB will continue its efforts to reach out to other FACA Committees, inside and outside the Agency. The Board played a key role in instigating the first meeting of FACA Chairs in November, 2000. The SAB seeks to enhance the value of FACA advice to the Agency by strategically inter-linking the efforts of the different FACA Committees. This pursuit may well include having additional liaison participation between SAB and other FACA Committees. [The SAB Executive Committee currently invites the chairs of three FACA committees to its meetings: the Board of Scientific Counselors, the Children's Health Protection Advisory Committee, and the FIFRA Scientific Advisory Panel.] The SAB will likely have additional opportunities to review cross-Agency products (e.g., the RAC's review of the multi-Agency authored MARLAP [Multi-Agency Radiological Analytical Protocols] manual), involving members of FACA committees from other Agency, as appropriate.

The Board will build on its experience with the joint SAB/Agency workshop mechanism as a means of providing advice in new ways on important, complex issues. These issues will include the following:

(a) The role of the SAB in the innovative stakeholder processes being used by the Agency.

(b) The continuing challenge to reflect public values in the process of estimating benefits of selected Agency actions.

FY 2001 will find the Board exploring new ways to provide more timely advice, while conserving resources and making its processes even more accessible to the public. The Board should realize increased benefits from the advances in computer technology that were the subject of significant investments in the year 2000, which

included:

(a) A fire-wall protected Discussion DataBase that allows SAB Panel members to edit their reports more expeditiously, while being fully informed of every participant's views.

(b) An office-focused People DataBase that allows more rapid and more reliable entry and maintenance of critical information regarding SAB M/Cs.

(c) A computer projector whose use will facilitate capturing SAB Panel consensus and editing selected critical portions of text.

In addition, the Board anticipates experimenting with "Net meetings" in FY 2001, where SAB Members interact through publicly accessible means via the Internet.

Within the office, a list of more mundane, but no less important, matters of infrastructure enhancements include the following:

(a) An updated draft of office standard operating procedures and SAB Member/Consultant Handbook.

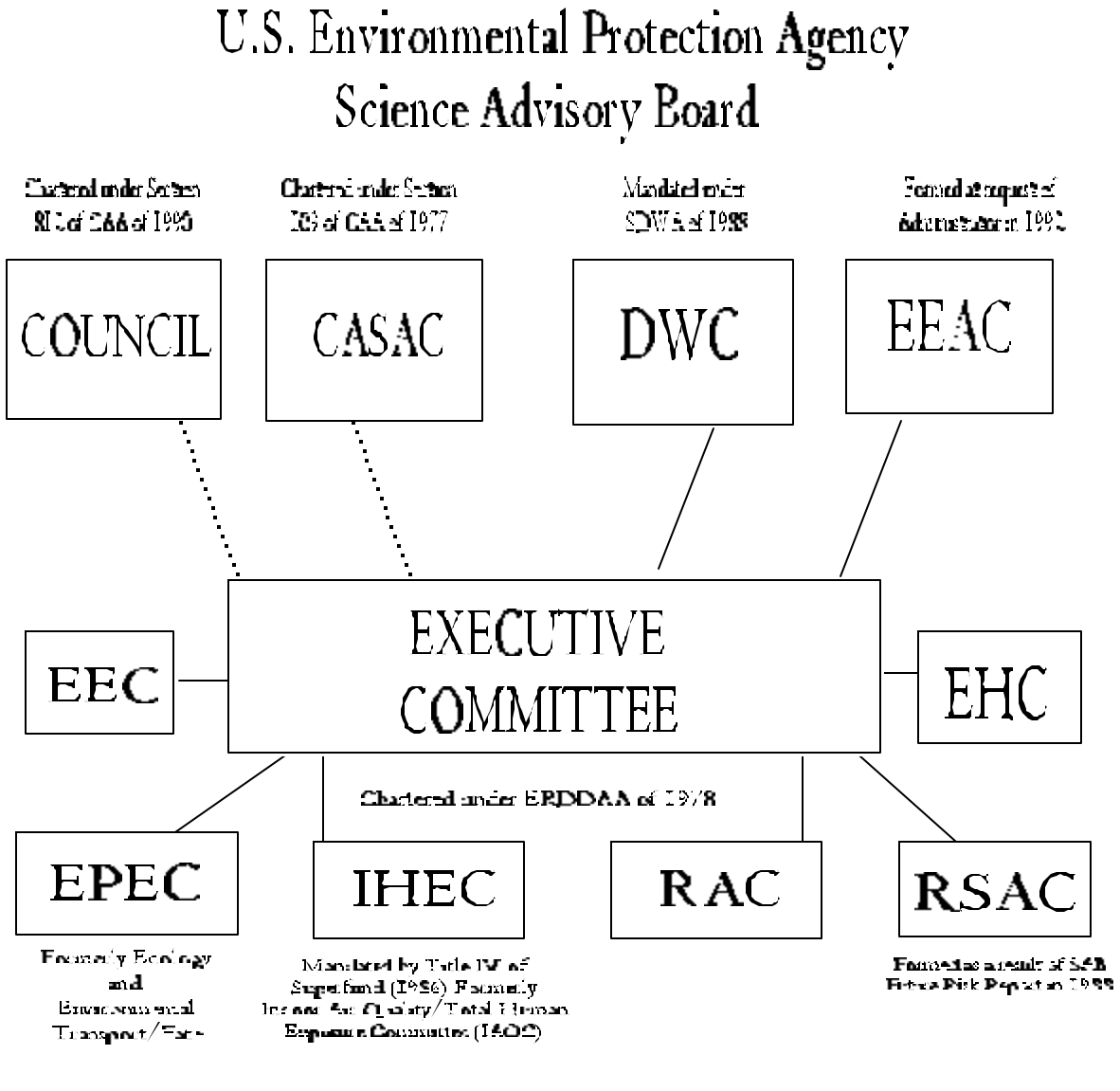
(b) Conversion of SAB office files to the Agency-wide filing system.

In short, FY 2001 will be a continuation of the SAB's efforts to bring some of the nation's finest technical talent together in order to take the highest quality scientific information and make it real in the context of the protection of public health and the environment.

APPENDIX A

SAB'S STRUCTURE & AUTHORITIES

A1
ORGANIZATIONAL CHART



A2

INTRODUCTION TO CHARTERS

The Science Advisory Board was formally established in 1978 by the Environmental Research, Development, and Demonstration Authorization Act (ERDDAA). The Board is a Federal Advisory Committee and must comply with the Federal Advisory Committee Act (FACA)(5 U.S.C.) and regulated regulations. The Board is a consists of 10 Committees coordinated by an Executive Committee.

The Charter describes an Executive Committee that includes representation from the Clean Air Scientific Advisory Committee (CASAC) and the Advisory Council on Clean Air Compliance Analysis (COUNCIL). Otherwise, the Board may organize itself as needed to meet its responsibilities. These groups must renew their charters every two years, announce their meetings in the Federal Register, and provide opportunities for public comment on issues under consideration. CASAC and COUNCIL are independently chartered FACA committees. As such, they report directly to the Administrator. However, they are administratively housed within the SAB and their Chairs participate as fully integrated members of the SAB Executive Committee.

An advisory committee charter is intended to provide a description of a committee's mission, goals, and objectives. It also provides a basis for evaluating a committee's progress and its effectiveness. The advisory committee charter must contain the following information:

(1) The committee's official designation;
(2) The objectives and the scope of the committee's activity
(3) The period of time necessary to carry out the committee's purpose(s)
(4) The agency or official to whom the committee reports
(5) The agency responsible for providing the necessary support to the committee
(6) A description of the duties for which the committee is responsible and specification of the authority for any non-advisory functions
(7) The established annual operation costs to operate the committee in dollars and person years
(8) The estimated number and frequency of committee meetings
(9) The planned termination date, if less than 2 years from the date of establishment of the committee
(10) The name of the individual and/or organization responsible for fulfilling the provisions of section 6(b) of FACA, which requires a report to the Congress one year after a Presidential advisory committee provides public recommendations to the President; and
(11) The date the committee charter is filed.

A2.1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ADVISORY COMMITTEE CHARTER

EPA SCIENCE ADVISORY BOARD

1. Committee's Official Designation (Title):

EPA Science Advisory Board

2. Authority:

This charter renews the EPA Science Advisory Board (SAB) in accordance with the provisions of the Federal Advisory Committee Act (FACA), 5 U.S.C. App § 9 (c). SAB is in the public interest and supports EPA in performing its duties and responsibilities. The former Science Advisory Board, administratively established by the Administrator of EPA on January 11, 1974, was terminated in 1978 when the Congress created the statutorily mandated Science Advisory Board by the Environmental Research, Development, and Demonstration Authorization Act (ERDDAA) of 1978, 42 U.S.C. 4365. The Science Advisory Board charter was renewed October 31, 1979; November 19, 1981; November 3, 1983; October 25, 1985; November 6, 1987; November 8, 1989, November 8, 1991, November 8, 1993, November 8, 1995, and November 7, 1997.

3. Objectives and Scope of Activities:

The objective of the Board is to provide independent advice and peer review to EPA's Administrator on the scientific and technical aspects of environmental problems and issues. While the Board reports to the Administrator, it may also be requested to provide advice to U. S. Senate Committees and Subcommittees and U.S. House Committees and Subcommittees, as appropriate. The Board will review scientific issues, provide independent scientific and technical advice on EPA's major programs, and perform special assignments as requested by Agency officials and as required by the Environmental Research, Development, and Demonstration Authorization Act of 1978, the Clean Air Act Amendments of 1977, and the Clean Air Act Amendments of 1990.

The major objectives are to review and provide EPA advice and recommendations on:

(1) The adequacy and scientific basis of any proposed criteria document, standard, limitation, or regulation under the Clean Air Act, the Federal Water Pollution Control Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Toxic Substances Control Act, the Safe Drinking Water Act, the Comprehensive Environmental Response, Compensation, and Liability Act, or any other authority of the Administrator

(2) The scientific and technical adequacy of Agency programs, guidelines, documents, methodologies, protocols, and tests

(3) New or revised scientific criteria or standards for protection of human health and the environment

d. Matters as required under the Clean Air Act, as amended in 1977 and 1990, through the Clean Air Scientific Advisory Committee and the Advisory Council on Clean Air Compliance Analysis

e. New information needs and the quality of Agency plans and programs for research, development and demonstration

f. The relative importance of various natural and anthropogenic pollution sources

As appropriate, the SAB consults and coordinates with:

a. The Scientific Advisory Panel established by the Administrator pursuant to section 21 (b) of the Federal Insecticide, Fungicide and Rodenticide Act, as amended; and other Agency FACA Committees; and

b. Other Federal advisory groups, as appropriate, to conduct the business of the Board

4. Description of Committees Duties:

The duties of the SAB are solely advisory in nature.

5. Official(s) to Whom the Committee Reports:

The Committee will report with its advice and recommendations to the Administrator of the Environmental Protection Agency.

6. Agency Responsible for Providing the Necessary Support:

EPA will be responsible for financial and administrative support. Within EPA, this support will be provided by the Office of the Administrator.

7. Estimated Annual Operating Costs and Work Years:

The estimated annual operating cost of the SAB is $2,143,900 which includes 16.70 work-years of support.

8. Estimated Number and Frequency of Meetings:

There will be approximately fifty (50) meetings of SAB's standing committees and specialized subcommittees each year. Meetings may occur approximately four (4) to five (5) times a month, or as needed and approved by the Designated Federal Officer (DFO). EPA may pay travel and per diem expenses when determined necessary and appropriate. A full-time or permanent part-time employee of EPA will be appointed as the (DFO). The DFO or a designee will be present at all meetings and each meeting will be conducted in accordance with an agenda approved in advance by the DFO. The DFO is authorized to adjourn any meeting when he or she determines it in the public interest to do so. Among other things, FACA requires open meetings and an opportunity for interested persons to file comments before or after such meetings, or to make statements to the extent that time permits.

9. Duration and Termination:

The SAB will be needed on a continuing basis. This charter will be effective until November 8, 2001, at which time it may be renewed for another two-year period.

10. Member Composition:

The SAB's Executive Committee will be composed of approximately seventeen (17) members, who are the chairs of SAB's standing committees, chairs from the separately chartered Advisory Council on Clean Air Compliance Analysis, the Clean Air Act Scientific Advisory Committee, and at-large members. Most members will serve as Special Government Employees. Members will be selected from among, but are not limited to; independent scientists, engineers, and economists to provide a range of expertise required to assess the scientific and technical aspects of environmental issues.

11. Subgroups:

EPA may form SAB subcommittees or workgroups for any purpose consistent with this charter. Such subcommittees or workgroups may not work independently of the chartered committee. Subcommittees or workgroups have no authority to make decisions on behalf of the chartered committee nor can they report directly to the Agency.

November 2, 1999
Agency Approval Date

November 8, 1999
Date Filed with Congress

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A2.2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ADVISORY COMMITTEE CHARTER

CLEAN AIR SCIENTIFIC ADVISORY COMMITTEE
OF THE SCIENCE ADVISORY BOARD

1. Committee's Official Designation (Title):

Clean Air Scientific Advisory Committee

2. Authority:

This charter renews the Clean Air Scientific Advisory Committee (CASAC) in accordance with the provisions of the Federal Advisory Committee Act (FACA), 5 U.S.C. App. § 9 (c). CASAC is in the public interest and supports EPA in performing its duties and responsibilities. CASAC was specifically directed by law on August 7, 1977 under § 109 of the Clean Air Act, as amended [ACT], 42 U.S.C. 7409), and the charter was renewed on August 6, 1979; July 22, 1981; August 1, 1983; July 23, 1985; August 5, 1987; August 7, 1989; August 7, 1991; September 30, 1993, August 7, 1995, and August 7, 1997.

3. Objectives and Scope of Activities:

CASAC will provide advice, information and recommendations on the scientific and technical aspects of issues related to the criteria for air quality standards, research related to air quality, source of air pollution, and the strategies to attain and maintain air quality standards and to prevent significant deterioration of air quality.

The major objectives are to:

(a) Not later than January 1, 1980, and at five year intervals thereafter, complete a review of the criteria published under § 108 of the Clean Air Act and the national primary and secondary ambient air quality standards and recommend to the Administrator any new

national ambient air quality standards or revision of existing criteria and standards as may be appropriate

(b) Advise the Administrator of areas where additional knowledge is required concerning the adequacy and basis of existing, new, or revised national ambient air quality standards

(c) Describe the research efforts necessary to provide the required information

(d) Advise the Administrator on the relative contribution to air pollution concentrations of natural as well as anthropogenic activity

(e) Advise the Administrator of any adverse public health, welfare, social, economic, or energy effects which may result from various strategies for attainment and maintenance of such national ambient air quality standards

4. Description of Committees Duties:

The duties of CASAC are solely advisory in nature.

5. Official(s) to Whom the Committee Reports:

The Committee will submit advice and recommendations and report to the Administrator of the Environmental Protection Agency.

6. Agency Responsible for Providing the Necessary Support:

EPA will be responsible for financial and administrative support. Within EPA, this support will be provided by the Science Advisory Board, Office of the Administrator.

7. Estimated Annual Operating Costs and Work Years:

The estimated annual operating cost of the CASAC is $260,500 which includes 1.4 work-years of support.

8. Estimated Number and Frequency of Meetings:

The committee expects to meet approximately three (3) to six (6) times a year. Meetings may occur approximately once every two (2) to four (4) months or as needed and approved by the Designated Federal Officer (DFO). EPA may pay travel and per diem expenses when determined necessary and appropriate. A full-time or permanent part-time employee of EPA will be appointed as the (DFO). The DFO or a designee will be present at all meetings and each meeting will be conducted in accordance with

an agenda approved in advance by the DFO. The DFO is authorized to adjourn any meeting when he or she determines it in the public interest to do so. Among other things, FACA requires open meetings and an opportunity for interested persons to file comments before or after such meetings, or to make statements to the extent that time permits.

9. Duration and Termination:

CASAC will be needed on a continuing basis. This charter will be effective until August 7, 2001, at which time it may be renewed for another two-year period.

10. Member Composition:

CASAC will be composed of seven (7) members. The Administrator will appoint a Chairperson and six members including at least one member of the National Academy of Sciences, one physician, and one person representing State air pollution control agencies. Members shall be persons who have demonstrated high levels of competence, knowledge, and expertise in the scientific/technical fields relevant to air pollution and air quality issues. Most members will serve as Special Government Employees (SGE).

11. Subgroups:

EPA may form CASAC subcommittees or workgroups for any purpose consistent with this charter. Such subcommittees or workgroups may not work independently of the chartered committee. Subcommittees or workgroups have no authority to make decisions on behalf of the chartered committee nor can they report directly to the Agency.

July 29, 1999
Agency Approval Date

August 6, 1999
Date Filed with Congress

A2.3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ADVISORY COMMITTEE CHARTER

ADVISORY COUNCIL ON CLEAN AIR COMPLIANCE ANALYSIS
OF THE SCIENCE ADVISORY BOARD

1. Committee's Official Designation (Title):

Advisory Council on Clean Air Compliance Analysis (Council)

2. Authority:

This charter renews the Advisory Council on Clean Air Compliance Analysis (Council) in accordance with the provisions of the Federal Advisory Committee Act (FACA), 5 U.S.C. App. § 9 (c). The Council is in the public interest and supports the Environmental Protection Agency (EPA) in performing its duties and responsibilities. The Council was specifically directed under § 812 of the Clean Air Act, as amended on November 15, 1990 (42 U.S.C. 7401 *et seq.*).

3. Objectives and Scope of Activities:

The Council will provide advice, information and recommendations on technical and economic aspects of analyses and reports which EPA prepares concerning the impacts of the Clean Air Act (CAA) on the public health, economy, and environment of the United States.

The major objectives required of the Council by the Clean Air Act Amendments of November 15, 1990 are:

(a) Review data to be used or any analysis required under section 812 and make recommendations on its use.

(b) Review the methodology used to analyze such data and make recommendations on the use of such methodology.

(c) Prior to the issuance of a report to Congress required under Section 812, review the findings of the report and make recommendations concerning the validity and utility of such findings

At EPA's request, the Council will:

(d) Review other reports and studies prepared by EPA relating to the benefits and costs of the CAA.

(e) Provide advice on areas where additional knowledge is necessary to fully evaluate the impacts of the CAA and the research efforts necessary to provide such information.

4. Description of Committees Duties:

The duties of the Council are solely advisory in nature.

5. Official(s) to Whom the Committee Reports:

The Committee will report to the Administrator of the Environmental Protection Agency. Advice and recommendations will also be submitted to the Administrator of EPA.

6. Agency Responsible for Providing the Necessary Support:

EPA will be responsible for financial and administrative support. Within EPA, this support will be provided by the Science Advisory Board (SAB).

7. Estimated Annual Operating Costs and Work Years:

The estimated annual operating cost of the Council is $201,200 which includes 0.25 work-years of support.

8. Estimated Number and Frequency of Meetings:

The Council expects to meet approximately two (2) to four (4) times a year. Meetings will likely occur approximately once every three (3) to six (6) months, or as needed and approved by the Designated Federal Officer (DFO). EPA may pay travel and per diem expenses when determined necessary and appropriate. A full-time or permanent part-time EPA employee will be appointed as DFO. The DFO or a designee will be present at all meetings, and each meeting will be conducted in accordance with an agenda approved in advance by the DFO. The DFO is authorized to adjourn any meeting when he or she determines it in the public interest to do so. Among other things, FACA requires open meetings and

an opportunity for interested persons to file comments before or after such meetings, or to make statements to the extent that time permits.

9. Duration and Termination:

The Council will be needed on a continuing basis, and may be renewed upon the expiration of each successive two year period following the date of enactment of the CAA (as amended on November 15, 1990), as authorized in accordance with § 14 of FACA.

10. Member Composition:

The Council will be composed of at least 9 members. Members will be appointed by the Administrator after consultation with the Secretary of Commerce and the Secretary of Labor. Most members will serve as Special Government Employees (SGE), subject to conflict-of-interest restrictions. Members will be selected from among, but are not limited to, recognized experts from the fields of health and environmental effects of air pollution, economics analysis, environmental sciences.

11. Subgroups:

EPA may form Council subcommittees or workgroups for any purpose consistent with this charter. Such subcommittees or workgroups may not work independently of the chartered committee. Subcommittees or workgroups have no authority to make decisions on behalf of the chartered committee nor can they report directly to the Agency.

December 14, 1998
Agency Approval Date

December 17, 1998
Date Filed with Congress

APPENDIX B

SAB ACTIVITIES & PRODUCTS

B1

SAB FACA MEETINGS FOR FY 2000

Glossary of Acronyms for the Science Advisory Board

BOSC	Board of Scientific Counselors
CASAC	Clean Air Scientific Advisory Committee
COUNCIL	Council on Clean Air Compliance Analysis
AQMS	Air Quality Modeling Subcommittee
HEES	Health and Ecological Effects Subcommittee
DWC	Drinking Water Committee
EC	Executive Committee
EEAC	Environmental Economics Advisory Committee
EEC	Environmental Engineering Committee
EHC	Environmental Health Committee
EPEC	Ecological Processes and Effects Committee
IHEC	Integrated Human Exposure Committee
IRP	Integrated Risk Project
RAC	Radiation Advisory Committee
RROS	Risk Reduction Options Subcommittee
RSAC	Research Strategies Advisory Committee

Note: **F** *indicates teleconferences; all other meetings are face to face. All meetings were held in Washington, DC unless otherwise noted.*

First Quarter	**Committee**	**Topic(s)**
F October 1	COUNCIL	Benefits and Costs of Clean Air Act
F October 7	EEC	Planning
F October 15	COUNCIL	Benefits and Costs of Clean Air Act
October 27-28	EC Subcommittee	Chloroform
November 12	EEAC	Induced Travel
November 16-18	RAC	Radon Risk Assessment, Orphan Source Continuation of Metals, Border Detectors; Planning

	November 18	CASAC	Carbon Monoxide CD II, Carbon Monoxide SP I; PM Review Update (Durham, NC)
F	November 22	EC	Review Meeting
	November 29-30	EC	Regular Meeting
	November 30	EC Subcommittee/SAP	Use of Human Data
	December 1	CASAC	Diesel Health Assessment (Durham, NC)
	December 2	CASAC	Particulate Matter CD; PM Staff Paper Development Plan and PM Risk Assessment Development Plan (Durham, NC)
	December 13-14	EC Subcommittee	TRIM (RTP, NC)
F	December 21	EC	Review Meeting

Second Quarter	**Committee**	**Topic(s)**
January 12-13	EC Subcommittee/BOSC	Science to Achieve Results (STAR)
F January 26	EEC Subcommittee	Natural Attenuation
F February 16	RSAC	Peer Review - Phase II
February 23-24	RSAC	Budget Review
F February 24	EEC Subcommittee	Natural Attenuation
February 25	EEAC	Benefits Adjustment White Paper
March 1-2	EC Subcommittee	Residual Risk for Lead Smelters (RTP, NC)
March 6-8	EEC Subcommittee	Environmental Technology Verification
March 7-8	EC	Regular Meeting; Science & Stakeholder Involvement
March 9-10	EEC	Pollution Prevention/Social Sciences, Measures of Technical Performance;

			Environmental Technology Verification
	March 13-14	DWC	Long Term 1 ESWTR - Filter Backwash; Arsenic; Candidate Contaminant List; Groundwater Rule
	March 29-30	EC Subcommittee	Toxics Monitoring Strategy
F	March 30	EEC Subcommittee	Natural Attenuation

Third Quarter		**Committee**	**Topics(s)**
F	April 17	IRP	Integrated Risk Report Peer Review
	April 18-19	CASAC Subcommittee	Fine Particles (RTP, NC)
	April 25-26	EPEC	A Framework for Reporting on Ecological Conditions
	April 25-27	RAC	TENORM, GENII Version 2.0 Model; Sewage Sludge
F	May 1	EEC Subcommittee	Natural Attenuation
F	May 1	EC	Review Meeting
F	May 3	EEC	Measures of Technology Performance; Environmental Technology Verification
F	May 30	EC	Review Meeting
F	June 5	EEC Subcommittee	Diffusion & Adoption of Innovations in Environmental Protection
	June 5-7	DWC	Arsenic in Drinking Water
F	June 16	EC	Review Meeting
F	June 19	EPEC	A Framework for Reporting on Ecological Conditions
F	June 21	CASAC Subcommittee	Federal Reference Method Report to Congress
	June 22-23	EC Subcommittee	Scientific & Technological Achievement Awards
	June 22-23	EC Subcommittee	Hazardous Air Pollutants Workshop

	June 28	EEC Subcommittee	Diffusion & Adoption of Innovations in Environmental Protection
F	June 30	EC	Review Meeting

Fourth Quarter		**Committee**	**Topic(s)**
F	July 5	CASAC	Review Subcommittee Report on PM 2.5 Monitoring Network
	July 10-11	IHEC	NHEXAS (RTP, NC)
	July 12-13	EC	Environmental Justice Public Health Research.; Science & Stakeholder Involvement (RTP, NC)
F	July 28	CASAC	Section 6102(e) of the Transportation Equity Act for the 21st Century
F	August 1	RAC	Various Issues
	August 8-9	DWC	Candidate Containment List Research Strategy (Cincinnati, OH)
	August 14-15	EEC Subcommittee	Natural Attenuation
	August 30	EHC	IRIS
F	September 20	EEC	Diffusion Workshop Results
	September 20-22	EPEC	A Framework for Reporting on Ecological Conditions
F	September 22	EC	Review Meeting

B2

SAB Activities by Committee for Fiscal Years 1996 - 2000

Committee	Fiscal Year	Committee Activites[1]			Number of Reports[2]		
		Meetings	Teleconference	Total	Full	Short	Total
E C	1996	3	2	5	1	2	3
	1997	3	3	6	0	4	4
	1998	3	5	8	0	0	0
	1999	3	6	9	0	0	0
	2000	3	7	10	0	3	3
EC/ad hoc Subcom.	1996	10	11	21	0	0	0
	1997	17	10	27	2	0	2
	1998	8	0	8	2	0	2
	1999	9	1	10	6	4	10
	2000	8	1	9	8	4	12
COUNCIL	1996	2	1	3	1	1	2
	1997	1	6	7	0	3	3
	1998	3	0	3	0	2	2
	1999	4	2	6	0	3	3
	2000	0	2	2	0	3	3
CASAC	1996	5	1	6	0	8	8
	1997	1	0	1	0	1	1
	1998	3	0	3	0	1	1
	1999	3	1	4	1	8	9
	2000	4	3	7	1	4	5

SAB Activities by Committee for Fiscal Years 1996 - 2000 (continued)

Committee	Fiscal Year	Committee Activites[1]			Number of Reports[2]		
		Meetings	Teleconference	Total	Full	Short	Total
DWC	1996	2	1	3	0	2	2
	1997	1	1	2	1	1	2
	1998	2	0	2	0	1	1
	1999	2	0	2	1	1	2
	2000	3	0	3	0	3	3
EPEC	1996	3	1	4	0	0	0
	1997	2	0	2	2	5	7
	1998	2	1	3	2	1	3
	1999	2	1	3	1	0	1
	2000	2	1	3	2	0	2
EEAC	1996	0	0	0	0	0	0
	1997	0	0	0	0	0	0
	1998	2	0	2	0	1	1
	1999	2	1	3	1	1	2
	2000	2	0	2	1	0	1
EEC	1996	2	1	3	1	0	1
	1997	3	0	3	3	1	4
	1998	6	0	6	4	1	5
	1999	4	1	5	1	5	6
	2000	4	8	12	1	2	3

SAB Activities by Committee for Fiscal Years 1996 - 2000 (continued)

Committee	Fiscal Year	Committee Activites[1]			Number of Reports[2]		
		Meetings	Teleconference	Total	Full	Short	Total
EHC	1996	1	0	1	0	0	0
	1997	1	0	1	2	1	3
	1998	3	0	3	1	0	1
	1999	0	0	0	4	0	4
	2000	1	0	1	0	1	1
IHEC	1996	1	0	1	0	1	1
	1997	2	0	2	0	1	1
	1998	2	0	2	1	1	2
	1999	1	0	1	1	3	4
	2000	1	0	1	1	0	1
RAC	1996	2	4	6	0	2	2
	1997	4	1	5	1	0	1
	1998	6	2	8	0	1	1
	1999	2	1	3	2	4	6
	2000	2	1	3	1	0	1
RSAC	1996	0	2	2	0	1	1
	1997	0	0	0	0	0	0
	1998	3	0	3	1	1	2
	1999	2	0	2	1	0	1
	2000	1	1	2	2	0	2

EC	Executive Committee
COUNCIL	Advisory Council on Clean Air Compliance Analysis
CASAC	Clean Air Scientific Advisory Committee
DWC	Drinking Water Committee
EEAC	Environmental Economics Advisory Committee
EEC	Environmental Engineering Committee
EHC	Environmental Health Committee
EPEC	Ecological Processes and Effects Committee
IHEC	Integrated Human Exposure Committee
RAC	Radiation Advisory Committee
RSAC	Research Strategies Advisory Committee

[1] Indicates meetings and public teleconferences requiring notice in the Federal Register.
[2] Reports are entered as Full Reports or Short Reports (which includes Letter Reports, Commentaries, and Advisories).

APPENDIX B3

ENHANCED DESCRIPTIONS OF SELECTED COMMITTEE ACTIVITIES

B3.1

ENHANCED DESCRIPTION OF CASAC ACTIVITIES FOR FY 2000 (Arranged by Criteria Pollutant)

1) Particulate Matter (PM) NAAQS

a) Criteria Document/Staff Paper - The CASAC previously met on this issue in December, 1999. A detailed peer review will take place at the next meeting which is planned for May 2001.

b) PM Research Strategy - The Committee last met to review the ORD draft *Airborne Particulate Matter: Research Strategy* in late FY1999. A meeting to review the revised document is planned for early FY2001.

c) Fine Particles/Federal Reference Method (FRM) - The CASAC Technical Subcommittee for Fine Particle Monitoring (the "Subcommittee") has been providing advice to the Office of Air and Radiation on PM monitoring activities since FY1999. The Subcommittee will continue to meet over the next few years to respond to its developing charge and to ensure that appropriate coordination is established with the National Research Council (NRC) committee on particles. During the past year, the Subcommittee was briefed on the status for the fine particle monitoring program with an emphasis on the chemical speciation and "Supersites" study programs and conducted an Advisory on the PM 2.5 monitoring network. The Subcommittee also met via teleconference on June 21, 2000 to conduct a peer review of the ORD draft report to Congress on its response to Section 6102(e) of the Transportation Equity Act for the 21st Century (a report which requires "*The Administrator [to] conduct a field study of the ability of the $PM_{2.5}$ Federal Reference Method to differentiate those particles that are larger than 2.5 micrograms [sic] in diameter. This study shall be completed and provided to the Committee on Commerce of the House of Representatives and the Committee on Environment and Public Works of the United States Senate no later than 2 years from the date of enactment of this Act*"). This report was due to Congress in early June, but EPA decided to delay the report in order to obtain peer review by CASAC.
CASAC completed the peer review conducted by its Subcommittee at a teleconference on July 28th.

2) Carbon Monoxide (CO) NAAQS - On November 18, 1999, the Committee completed its review (reaching closure) of the CO Criteria Document, producing a report on January 11th, 2000 (EPA-SAB-CASAC-LTR-00-002). A meeting on the first draft of the CO Staff Paper is planned for late 2001.

3) Ozone (O_3) NAAQS - No action during this fiscal year. The Committee plans to review the Ozone Research Strategy and Ozone Research Needs documents and Ozone Criteria Document Development Plan at a meeting that is planned for mid-FY2001.

4) Nitrogen Oxides (NO_x) (NAAQS) - No action during this fiscal year.

5) Lead (Pb) NAAQS - No action during this fiscal year.

6) Sulfur Oxides (SO_x) NAAQS - No action during this fiscal year.

7) Other Issues:

a) Diesel Health Assessment Document - The Committee reviewed this draft ORD document in May 1995 and May 1998, noting in both cases that the document was not scientifically adequate for making regulatory decisions. On June 10, 1999, the Committee held a Consultation with the Agency concerning the planned approaches for revising the draft Diesel Health Assessment. Then, based on output from that Consultation, CASAC conducted a third peer review of the revised draft document on December 1, 1999. Once again, the Committee was unable to reach closure on the draft report, although noting that the Agency had vastly improved its previous draft. Another meeting is planned for October 12-13, 2000.

B3.2

AMPLIFIED DESCRIPTION OF SELECTED EEC ACTIVITIES FOR FY 2000

The EEC's commitment to risk reduction can be seen in the welcome it has extended to the Board's social scientists. The EEC is the institutional home of the Subcommittee on the Diffusion and Adoption of Innovations in Environmental Protection (Dr. Roger Kasperson, Chair) which held a day-long consultative workshop a day-long consultative workshop June 28, 2000. The purpose of the workshop was to identify how the use of data, theories, and research methods derived from the study of the social process of diffusion and adoption of innovations may improve the adoption of innovative approaches to environmental protection: (a) within EPA; (b) by state, tribal, and local government partners; and (c) by corporate and non-governmental organization partners in environmental protection. The Subcommittee is preparing a Commentary letter to the Administrator on major recommendations identified in the workshop.

The Committee also involved a social scientist in its review of the Agency's Environmental Technology Verification pilot program designed to test different approaches to environmental technology verification. ETV has tested, or has tests underway for, 150 technologies. Because the technologies addressed are diverse, as are their applications, ETV has made extensive use of stakeholders and technical panels to design testing protocols to assure the data quality needs of the customers for the data are met. The ETV program has successfully adopted major elements of the Agency's Quality System early, well, and with enthusiasm. Overall, the EEC found the ETV program fundamentally sound and valuable. The Committee's draft commentary on Measures of Environmental Technology Performance, to be issued in early FY2001 is an outgrowth of the Committee's experiences with reviews of EPA's technology programs and quality system coupled with the members' real-world national and international experience with technology development, commercialization, and application in both regulatory and non-regulatory but environmentally principled environments.

The Committee's real-world expertise and participation on a variety of advisory committees, professional societies, and boards led it to develop a commentary on overcoming barriers to waste utilization. It chose to make the Agency aware of improving opportunities for large-scale waste utilization to contribute to cost-effective management of a fraction of the 23 million tons of “hazardous” wastes and hundreds of tons of non-hazardous wastes that are land-disposed annually in the United States.

In an effort to improve on its own contributions, the EEC charged a Subcommittee including past and current chairs to take a retrospective look at the Committee's achievements. That Subcommittee's commentary made recommendations for improvements in the areas of topic selection and charge; going beyond a narrow charge; developing a receptive clientele for self-initiated reviews; screening proposed topics for importance; working closely with program offices; review process; report completion; and communication and follow-up. *Improving the Efficacy of Science Advisory Board Reviews: A Study of the Attributes of Successful Technical Reviews* was the first commentary transmitted in FY2000.

A Subcommittee addressed the Agency's program on natural attenuation research and is expected to forward its report for approval in early FY2001.

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SAB FY 2000 PRODUCTS

FULL REPORTS	
EPA-SAB-00-001	Science Advisory Board FY 2000 Annual Staff Report: New Wineskins for New Wine
EPA-SAB-RSAC-00-002	Review of the Peer Review Program of the Environmental Protection Agency
EPA-SAB-EC-00-003	EPA's Per Capita Water Ingestion in the United States
EPA-SAB-CASAC-00-004	Review of the EPA's Draft Diesel Health Assessment Document for Diesel Emissions
EPA-SAB-EPEC-00-005	Review of an Integrated Approach to Metals Assessment in Surface Waters and Sediments
EPA-SAB-EPEC-00-006	Review of the Biotic Ligand of the Acute Toxicity of Metals
EPA-SAB-RSAC-00-007	Review of the FY 2001 Presidential Science and Technology Budget Request for the Environmental Protection Agency
EPA-SAB-EC-00-008	An SAB/BOSC Report: Review of the Science to Achieve Results (STAR) Program of the Environmental Protection Agency
EPA-SAB-EC-00-009	Review of the Draft Chloroform Risk Assessment
EPA-SAB-RAC-00-010	Assessment of Risks from Radon in Homes
EPA-SAB-EC-00-011	Toward Integrated Environmental Decision-Making
EPA-SAB-EEC-00-012	Review of EPA's Environmental Technology Verification Program
EPA-SAB-EEAC-00-013	An SAB Report on EPA's White Paper Valuing the Benefits of Fatal Cancer Risk Reduction
EPA-SAB-EC-00-014	Recommendations for the 1999 Scientific and Technological Achievement Awards (STAA) Nominations
EPA-SAB-EC-00-015	Review of Draft Air Toxics Monitoring Strategy Concept Paper
EPA-SAB-EC-00-016	Review of the EPA's Draft Revised Cancer Risk Assessment Guidelines Pertaining to Children

SAB FY 2000 PRODUCTS (continued)

FULL REPORTS (continued)	
EPA-SAB-EC-00-017	Comments on the Use of Data from the Testing of Human Subjects
EPA-SAB-IHEC-00-018	Review of Draft Strategic Plan for the Analysis of National Human Exposure Assessment Survey (NHEXAS) Pilot Study
LETTER REPORTS	
EPA-SAB-EC-LTR-00-001	Review of the Draft Chloroform Risk Assessment and Related Issues in the Proposed Cancer Risk Assessment Guidelines
EPA-SAB-CASAC-LTR-00-002	Closure by CASAC on the Document: Air Quality Criteria for Carbon Monoxide
EPA-SAB-CASAC-LTR-00-003	Review of the Draft Air Quality Criteria Document for Particulate Matter
EPA-SAB-EC-LTR-00-004	Review of the SAB Report " Toward Integrated Environmental Decision-Making"
EPA-SAB-DWC-LTR-00-005	Report on EPA's Draft Proposal for the Groundwater Rule
EPA-SAB-CASAC-LTR-00-006	Review of the US EPA Response to Section 6102(e) of the Transportation Equity Act for the 21st Century
EPA-SAB-EHC-LTR-00-007	Review of the Draft Report to the Congress "Characterization of Data Uncertainty and Variability in IRIS Assessments, Pre-Pilot vs. Pilot/Post-Pilot"

SAB FY 2000 PRODUCTS (CONTINUED)

ADVISORIES	
EPA-SAB-COUNCIL-ADV-00-001	The Clean Air Act Amendment (CAAA) Section 812 Prospective Study of Costs and Benefits (1999): Advisory by the Health and Ecological Effects Subcommittee on Initial Assessments of Health and Ecological Effects; Part 2
EPA-SAB-COUNCIL-ADV-00-002	The Clean Air Act Amendments (CAAA) Section 812 Prospective Study of Costs and Benefits (1999): Advisory by the Advisory Council on Clean Air Compliance Analysis: Costs and Benefits of the CAA
EPA-SAB-COUNCIL-ADV-00-003	Final Advisory on the 1999 Prospective Study fo Costs and Benefits (1999) of Implementation of the Clean Air Act Amendments (CAAA)
EPA-SAB-EC-ADV-00-004	Review of the "Total Risk Integrated Methodology" (TRIM)
EPA-SAB-EC-ADV-00-005	Advisory on the USEPA's Draft Case Study Analysis of the Residual Risk of Secondary Lead Smelters
EPA-SAB-CASAC-ADV-00-006	Advisory on the PM 2.5 Monitoring Network
EPA-SAB-DWC-ADV-00-007	An SAB Advisory on EPA's Draft Contaminant Candidate List (CCL) Research Plan
COMMENTARIES	
EPA-SAB-EEC-COM-00-001	Commentary on Improving the Efficacy of SAB Reviews: A Study of the Attributes of Successful Technical Review by the Environmental Engineering Committee
EPA-SAB-EC-COM-00-002	Commentary on the Role of Science in New Approaches to Environmental Decision-making that Focus on Stakeholder Involvement
EPA-SAB-EC-COM-00-003	Commentary on the Agency's Proposed Drinking Water Standard for Radon

SAB FY 2000 PRODUCTS (continued)

COMMENTARIES (continued)	
EPA-SAB-DWC-COM-00-004	Commentary on EPA's Draft Proposed for a Long-Term 1 Enhanced Surface Water Treatment and Filter Backwash Rule
EPA-SAB-EC-COM-00-005	Executive Committee Commentary on Residual Risk Program
EPA-SAB-EEC-COM-00-006	Commentary and Recommendations on Overcoming Barriers to Waste Utilization
CONSULTATIONS	
EPA-SAB-CASAC-CON-00-001	Notification of a Consultation on the Development of the Carbon Monoxide Staff Paper
EPA-SAB-EEAC-CON-00-002	Notification of a Consultation on Induced Travel: Does Additional Highway Capacity Influence Travel Demand
EPA-SAB-EC-CON-00-003	Notification of a Consultation on the Study of the Integrated Risk Information System (IRIS)
EPA-SAB-CASAC-CON-00-004	Notification of a Consultation on the Development of the Particulate Matter Staff Paper
EPA-SAB-EPEC-CON-00-005	Notification of a Consultation on the Ecological-Soil Screening Levels
EPA-SAB-CASAC-CON-00-006	Notification of a Consultation on Thermal Carbon Analysis
EPA-SAB-CASAC-CON-00-007	Notification of a Consultation on Sampler Intercomparison Study
EPA-SAB-RAC-CON-00-008	Notification of a Consultation on ISCORS Sewage Sludge Dose Modeling Scenarios

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ABSTRACTS OF SAB REPORTS, ADVISORIES, AND COMMENTARIES

FULL REPORTS

Science Advisory Board FY 1999 Annual Staff Report:
New Wineskins for New Wine
EPA-SAB-00-001

The Science Advisory Board Staff's annual report captures the SAB's activities for FY 1999.

An SAB Report: Review of the Peer Review Program
of the Environmental Protection Agency
EPA-SAB-RSAC-00-002

On September 23 and 24, 1999 the RSAC met to review the Agency's peer review program. The Committee responded to five charge questions. The RSAC found that the Peer Review processes appear to be well established at the EPA. The Science Policy Council Peer Review Handbook is an excellent guidance document and provides definitive criteria for deciding what to peer review. Some concerns still remain regarding the process leading to the decision to peer review or not because of the funding available and/or because of pressure to complete the work product before peer review due to timing constraints. Consistent with the intent of the policy, the practice of peer review should not be limited to final products but should also be extended to the up-front review of significant scientific and technical planning products such as strategic plans, analytic blueprints, research plans, and goals documents. In general, the Handbook contains good guidance on issues related to conflict of interest for the peer reviewers. However, there is concern with respect to conflict of interest of the Peer Review Leader. The Handbook states that the Peer Review Leader could be the Decision-maker, but Decision-makers often have a professional interest in the outcome of the review. The RSAC suggests that EPA include interagency and international products that are used in support of environmental decision-making in the US under the peer review policy. The evaluation of EPA's peer review process is expected to be conducted over two to three years. Therefore, RSAC could not fully address the charge questions "Are the reviews and resulting advice timely" and "Do the peer reviews make a difference?"during this first review. Data need to be collected and case studies developed to help the RSAC address these questions.

A SAB Report on EPA's Per Capita Water Ingestion in the United States EPA-SAB-EC-00-003

The Drinking Water Intake Subcommittee (DWIS) of the Executive Committee reviewed a report on the *Estimated Per Capita Water Consumption in the United States.* The document presents estimates of drinking water ingestion for the total U.S. population and a number of subgroups of interest. Estimates are given for many age, gender, and other descriptors. The Subcommittee was pleased with the report's use of a substantial existing data base to improve upon the current EPA estimates for drinking water ingestion. The current Report is largely descriptive and contains little discussion of factors embedded within the original survey and the Agency's analytical method for deriving estimates that inform the reader of important factors that should guide use of the estimates. The Subcommittee noted its desire to see a greater level of discussion on these elements so that unintended misuse of the data can be minimized.

CASAC Review of the EPA's Health Assessment Document for Diesel Emissions EPA-SAB-CASAC-00-004

On December 1, 1999, the Clean Air Scientific Advisory Committee (CASAC) reviewed EPA's November 1999 draft document, *Health Assessment Document for Diesel Emissions* (EPA 600/8-90/057D). The draft reviewed by the Committee was considerably improved over previous drafts. The Committee approved the framework of the present document and the general approach taken to portraying key information. However, the number of major and minor criticisms and recommendations raised by the Committee during the review precluded closure on the document without further review of changes made in response to CASAC comments.

No single issue precluded closure; rather, the combined weight of numerous major and minor issues contributed to the need for revision and re-review. However, much of the discussion surrounded two critical issues. First, there was substantial concern for the approach taken to deriving the uncertainty factors used in calculating the RfC value for noncancer health effects. Second, there was also substantial disagreement with the use of the descriptor "highly" to modify the category "likely" used to describe the potential human carcinogenicity of environmental exposures to diesel emissions.

In summary, the Committee recognized the document as a considerable improvement over previous drafts, and is encouraged that, after revisions responding suitably to the remaining concerns, the document could be approved as an acceptable representation of current knowledge on the potential health effects of diesel emissions.

Review of an Integrated Approach to Metals Assessment in Surface Waters and Sediments
EPA-SAB-EPEC-00-005

The Ecological Processes and Effects Committee (EPEC) met on April 6-7, 1999 to review the Office of Water's proposal for assessing the bioavailability and toxicity of metals in surface waters and sediments. The integrated methodology included use of the Biotic Ligand Model to predict the acute toxicity of metals to aquatic organisms and development of sediment quality guidelines based on the Simultaneously Extracted Metal-Acid Volatile Sulfide (SEM-AVS) approach. The Committee's comments on the BLM are included in a companion report (EPA-SAB-EPEC-00-006). The Committee concluded that the body of evidence supporting the SEM-AVS methodology is strong with regard to acute effects of sediment metals, and that the methodology is a powerful predictive tool suitable for incorporation into sediment assessment guidelines. At the same time, the Committee noted limitations of the methodology; first, it is still unclear whether adverse effects on biota are necessarily prevented when AVS exceeds SEM; and second, environmental conditions in many locations will be unsuitable for application of the methodology because underlying assumptions of the approach will be violated. For these reasons, the Committee recommended that the SEM-AVS methodology be incorporated into sediment guidelines in a way that makes clear the current limitations and ensures that the method will continue to be used in conjunction with other assessment tools, rather than being used as a stand-along test of whether sediments are "toxic" or "non-toxic" due to metals. The Committee concluded that, although the results from acute toxicity tests are promising, further research is required to support the addition of either chromium or silver to the Metals Mixtures Equilibrium Sediment Guidelines. In addition, the Committee recommended that the Agency turn its focus to appropriate application of SEM-AVS in the field, including the development and peer review of sampling protocols and a "sediment guidelines user's guide." The Committee urged the Agency to develop a refined conceptual model that incorporates all partitioning phases and routes of exposure in order to guide the Agency's long-term efforts to integrate water column and sediment standards and to assist users to apply current standards and guidelines appropriately.

Review of the Biotic Ligand Model of the Acute Toxicity of Metals
EPA-SAB-EPEC-00-006

The Ecological Processes and Effects Committee (EPEC) met on April 6-7, 1999 to review the Biotic Ligand Model (BLM) for predicting the acute toxicity of metals to aquatic organisms. The BLM has been developed to improve the estimation of the bioavailable fraction of dissolved metals, such as copper and silver, that may pose a risk to aquatic organisms in surface waters. The Agency proposes to incorporate the BLM in its approach to establishing water quality criteria that will be protective of aquatic organisms. In general, the Committee found that the BLM can significantly improve predictions of the acute toxicity of certain metals across a range of water chemistry parameters and that the model

could be a practical aid in site-specific water quality regulation and assessment, complementing and in some cases providing a ready alternative to current empirical (e.g., Water-Effect Ratio) approaches. At the same time, the Committee observed that there has not yet been sufficient time to validate the model in a number of areas, including: a broad range of aquatic organisms; longer term exposures; a wide variety of metals; or a comprehensive range of water chemistry parameters and naturally occurring field conditions. For this reason, the Committee concluded that it would be premature to use the BLM to revise the protocol for deriving national ambient water quality criteria without further model validation, but that application of the BLM for site-specific modification of criteria would be feasible in some cases (e.g., for calculation of site-specific modifications to the acute toxicity criterion for copper). The Committee recommended that the Agency continue to validate and verify the BLM because of its potential to improve future water quality criteria for metals.

Review of the FY2001 Presidential Science and Technology Budget Request for the Environmental Protection Agency EPA-SAB-RSAC-00-007

The Research Strategies Advisory Committee (RSAC) met February 23 and 24, 2000 to review the Science and Technology portion of the FY2001 Presidential Budget Request for the Environmental Protection Agency. RSAC felt that EPA has continued to make marked improvements in the budget and planning process. It found the request to be appropriately prioritized based on the Agency Strategic Plan, but it had reservations about the adequacy of the overall funding level given the increasing complexity and cost of environmental problems. Special concerns were the need for additional scientists and engineers to maintain core competencies and the observation that programs for which EPA has no statutory authority to regulate (e.g., indoor air and Naturally Occurring Radioactive Material) receive consistently low budget priorities despite their potentially high impacts on the environment and public health. Progress has been made to heighten the level of interaction between the Office of Research and Development and Program Offices. RSAC notes that many of the problems confronting the Agency are not solvable by the "media-specific" driven research. Thus, it is critical that the Agency maintain its core research program. The balance between long-term and short-term research needs and science and technology issues seems appropriate (e.g., in recent years, the Agency has initiated numerous long-term research efforts in the areas of children's health, global climate change, coastal ecosystem health, and dry deposition monitoring), but there is still no overall explicit approach to incorporate the requirements of longer-term research programs within the short-term budgetary process. Research on emerging issues needs to have ongoing, stable support because EPA is the key Agency responsible for aggressively watching for critical new environmental threats to human health and to ecosystems. The Government Performance and Results Act (GPRA) goals structure provides an excellent framework for aligning research priorities with the resources allocated to perform the work. However, RSAC is concerned that annual performance goals are still focused on specific products (i.e., reports, data collected, etc) and recommends that the program goals should focus instead on outcomes, and that the annual performance goals be related to milestones aimed towards achieving the long-term objectives identified in the Strategic Plan.

An SAB/BOSC Report: Review of the Science to Achieve Results (STAR) Program of the Environmental Protection Agency EPA-SAB-EC-00-008

On January 12-13, 2000 a joint subcommittee of the Science Advisory Board (SAB) and the Board of Scientific Counselors (BOSC) of the Office of Research and Development (ORD) met to review the Agency's Science to Achieve Results (STAR) Program. The STAR Program, which was established in Fiscal Year 1995, has the mission to include this country's universities and non-profit centers in EPA's research program and to ensure the best possible quality of science in areas of highest risk and greatest importance to the Agency. The Subcommittee was charged to evaluate whether or not the STAR Program is structured appropriately to achieve the stated purpose, to evaluate whether the program is integrated effectively with Agency strategic plans and programs, and to examine the adequacy of efforts to communicate with the external scientific and regulatory communities regarding STAR research opportunities and outputs. Although the Agency and the Subcommittee agreed that the STAR Program has not been in operation for long enough to allow evaluation of its impact on the Agency and the broader research community, the Subcommittee was asked to recommend measures and systems that should be used to monitor the STAR Program's impacts, costs, credibility, and effectiveness in later program reviews.

The Subcommittee's overall assessment was that the STAR Program is structured and managed so as to generate high-quality science, conducted by well-qualified scientists, on topics that are relevant to the environmental problems identified in the EPA Strategic Plan. Research Coordination Teams are an excellent mechanism for planning solicitations, and there has been significant and beneficial coordination with other agencies. Outreach to potential STAR applicants is strong, and the peer review of proposals is rigorous. The Subcommittee urged the Agency to continue exploring new management procedures such as multi-year program planning, web site key word search capabilities, and state-of-the-science reports on selected topics. The report describe a series of recommendations designed to make improvements to the management of the STAR Program, recommends measures and systems that should be used to monitor the STAR Program's impacts, costs, and effectiveness; and highlights the need for a comprehensive approach to communication of STAR results and expresses concern over the level of staff resources devoted to the program.

Review of the Draft Chloroform Risk Assessment EPA-SAB-EC-00-009

Drinking water surveys performed in the United States found chloroform (an unwanted by-product of the disinfection process) in a majority of water supply systems using surface water sources. There were concerns about chloroform producing adverse health effects, including cancer. EPA studied

both the disinfection process and the toxicology and health effects of chloroform ingestion and summarized and interpreted the data in a draft risk assessment document.

A Subcommittee of the Science Advisory Board met to review this document at a public meeting in Washington on October 27-28, 1999.

The Subcommittee agreed with EPA that sustained or repeated cytotoxicity with secondary regenerative hyperplasia in the liver and/or kidney of rats and mice precedes, and is probably a causal factor for hepatic and renal neoplasia, but expressed concern that a cytotoxicity/regenerative cell proliferation mode of action may not be the exclusive mode, and that alternative modes of action have not been rigorously studied.

The Subcommittee supported the Agency's attempt to address the complex scientific issues involved in assessing the dose-response relationship, but found it somewhat difficult to track the scientific bases for decisions in the document. The Subcommittee recommends revising the document to incorporate critical data on dose response and allow the consistency of the data to be more readily evaluated. Most Members agreed that the dose response for both liver and kidney neoplasia appears to be determined by cytotoxicity, and that a margin of exposure approach (MOE) or non-linear approach is most appropriate.

Assessment of Risks from Radon in Homes
EPA-SAB-RAC-00-010

Since radon is the principal contributor to effective dose to members of the general public from background radiation, the Environmental Protection Agency (EPA) has devoted substantial consideration to quantifying the risks from radon in homes. EPA has commissioned several studies to develop models and risk estimates based on epidemiologic data from underground miners.

The Office of Radiation and Indoor Air (ORIA) derived a risk model for residential exposures based on the models developed by the National Academy of Sciences' Biological Effects of Ionizing Radiation (BEIR) Committee. The Radiation Advisory Committee (RAC) reviewed the EPA model and the methods of estimating lung cancer risk from exposure to radon indoors. The RAC agrees with ORIA's methodology in general. However, ORIA did not adequately address the uncertainties in the risk estimates, in particular, model uncertainty.

The RAC recommends that ORIA address, at least qualitatively, biologically-based models and models which would result from application of alternate statistical methodology to the miner data. In addition, since a wide variety of users will apply the ORIA point risk estimates to specific situations, ORIA needs to make sure its methodology, assumptions, and the limitations of the model used are

transparent. Lack of understanding of the uncertainties in the assessment could result in misuse of the risk estimates.

Toward Integrated Environmental Decision-Making
EPA-SAB-EC-00-011

In Summer 2000, the EPA Science Advisory Board (SAB) released its report, *Toward Integrated Environmental Decision-making*. Marking the culmination of an extensive effort of interdisciplinary teams of scientists, engineers, and economists, the report explores the scientific and technical analyses that can and should inform environmental decisions, the strengths and limitations of current science and analytical techniques, the import of other inputs, and areas for future development. Among the findings and conclusions made by the Steering Committee were the following:

1. Scientists have important and unique contributions to make in protecting public health and the environment.
2. While scientists can help to characterize environmental risks, they are not solely qualified to set priorities among them and broader deliberation is essential.
3. Integrated environmental decision-making requires a process within which the decision-maker can meld the results of science and the goals of the people served.
4. Deliberative processes play an important role in eliciting values of people and in obtaining stakeholder participation in decision-making.
5. Integrated decision-making requires explicit consideration of the trade-offs involved in pursuing multiple goals.
6. Integrated decision-making should combine risks into logical groupings–for example, those with a common source or pathway–in order to identify risk reduction opportunities across stressors.
7. "Environmental Report Cards" are needed to measure and document performance and outcomes of risk reduction activities. An environmental results reporting system should include a mix of processes, stressors, exposures, and outcome measures.

Based on these findings and conclusions, the Board's report proposes a Framework for Integrated Environmental Decision-making that stresses integration—of information and techniques from multiple disciplines and points of view, and of multiple stressors, exposure routes, and effects. The report calls for an evolution in environmental decision-making that builds on, rather than replaces, existing regulatory processes and requirements. This evolution is characterized by a decision-making process that is a) transparent and well-documented; b) makes the best use of both analytical and deliberative processes; c) draws on the interdisciplinary expertise of scientists, managers, and members of the public; and d) looks at environmental problems in a whole and complete way in order to maximize the reduction of aggregate risk to populations or ecological systems.

The report also contains 10 recommendations intended to foster the evolution to Integrated Environmental Decision-making:

1. EPA should continue development of integrated, outcomes-based environmental protection, while maintaining the safeguards afforded by the current system.
2. Because science plays a critical role in protecting the environment, EPA should commit the resources necessary to expand the scientific foundation for integrated decision-making and outcomes-based environmental management.
3. EPA should apply and encourage the broader use of risk comparison methodologies that clearly identify how scientific information and judgment are incorporated into risk comparisons.
4. EPA should explore a broader range of risk reduction options in combination to manage environmental risks.
5. When evaluating risk reduction options, EPA should strive to weigh the full range of advantages and disadvantages, both those measured in dollars as costs and benefits and those for which there may not be a comprehensive dollar measure, such as sustainability and equity.
6. EPA should seek and develop methods to characterize public values and incorporate those values into goal-setting and decision-making.
7. EPA, by itself and in concert with others, should identify, collect, and disseminate scientifically-based environmental metrics organized in new ways to support a more integrated approach to managing environmental risk.
8. EPA, by itself and in concert with others, should develop a system of "report cards" to organize and disseminate information on the status of ecological and human health and the quality of life in order to assess the effectiveness of its environmental decisions and to guide future environmental management.
9. EPA should expand and develop new collaborative working relationships with other federal and non-federal governmental agencies and others who also will be involved in integrated environmental decision-making.
10. EPA should explore options for reducing risks from significant stressors that currently are addressed inadequately by the nation's environmental institutions.

Review of EPA's Environmental Technology Verification Program EPA-SAB-EEC-00-012

The Technology Evaluation Subcommittee of the Science Advisory Board's Environmental Engineering Committee reviewed the extent to which quality management is incorporated in the Environmental Technology Verification (ETV) program.

The Agency's Quality System and ANSI/ASQC E-4 provide an effective framework within which the Environmental Technology Verification (ETV) program has established a multi-tiered quality

assurance oversight system. The ETV program has ensured that the appropriate technology verification factors and level of quality management are consistent with marketplace demands by the extensive use of stakeholder advisory groups.

The Subcommittee recommended that the generic test protocols and Test/QA plans be improved by consistent employment of a systematic data quality planning process such as the DQO process (EPA QA/G-4). Consistent use of a systematic data quality planning process will ensure that future verification tests will be designed that reflect the inherent variability in technology performance.

To protect the credibility of the ETV program, verification partners and their subcontractors must comply with the same quality assurance requirements adopted by the Agency.

Report on EPA's White Paper Valuing the Benefits of Fatal Cancer Risk Reduction
EPA-SAB-EEAC-00-013

The Environmental Economics Advisory Committee (EEAC) reviewed the Agency's white paper *Valuing Fatal Cancer Risk Reductions* during a meeting on February 25, 2000 in response to a request received from EPA. The EEAC's general conclusion is that estimates of the value of statistical life (VSL) derived from wage-risk tradeoff studies should not be taken as precise estimates of the value of reducing the risk of fatal cancers, because of differences in the nature of the risks being valued and in the socio-economic characteristics of the affected populations, and because of various sources of uncertainty. In the Committee's judgment, there is not, at present, a sufficient theoretical and empirical basis for making most of the quantitative adjustments to the wage-risk-based VSL suggested by the Agency to account for these differences. Despite limitations of the VSL estimates, these seem to offer the best available basis at present for considering the value of fatal cancer risk reduction. We therefore recommend that the Agency continue to use a wage-risk-based VSL as its primary estimate, including appropriate sensitivity analyses to reflect the uncertainty of these estimates.

ADVISORIES

The Clean Air Act Amendments (CAAA) Section 812 Prospective Study of Costs and Benefits (1999): Advisory by the Health and Ecological Effects Subcommittee on Initial Assessments of Health and Ecological Effects; Part 2
EPA-SAB-COUNCIL-ADV-00-001

This report, from the Health and Ecological Effects Subcommittee (HEES) of the Advisory Council on Clean Air Compliance Analysis (Council), provides advice to improve the characterization of

the health and ecological effects in the June 1999 draft of an Agency document, "The Benefits and Costs of the Clean Air Act, 1990 to 2010, EPA Report to Congress." The HEES finds that the Project team responded well to the HEES' previous recommendations to include discussions of indirect effects of air pollutants on ecosystems and the need to eventually adopt a systems approach for the ecological analyses. The HEES notes that the draft does not provide a quantitative assessment of Health and Ecological Effects of Hazardous Air Pollutants (HAPs) and recommends a workshop to develop an improved approach for future studies. The HEES notes uncertainties concerning the health effects of Criteria Air Pollutants, expresses comfort with Agency efforts to caveat those uncertainties, and identifies research gaps to be filled to strengthen futures studies. The report suggests research needed to address current deficiencies in data and models to define exposure and health endpoints for human and ecological systems.

The Clean Air Act Amendments (CAAA) Section 812 Prospective Study of Costs and Benefits (1999): Advisory by the Advisory Council on Clean Air Compliance Analysis: Costs and Benefits of the CAAA
EPA-SAB-COUNCIL-ADV-002

This report from the Advisory Council on Clean Air Compliance Analysis (Council) provides advice to improve the assessment of costs and benefits in the June 1999 draft of an Agency document, "The Benefits and Costs of the Clean Air Act, 1990 to 2010, EPA Report to Congress." Subject to certain caveats, the Council expressed a belief that the Agency has produced credible estimates of the benefits and costs of the 1990 Clean Air Act Amendments, given the state of current knowledge. While the draft contains a reasonable representation of the standard literature on estimating costs and benefits, it is hampered by scientific uncertainties. These gaps in our knowledge – in air quality modeling, measurement of health and ecological endpoints, and valuation of reduced mortality and chronic lung disease – limit the usefulness of the study as a guide to policy and will hamper future studies unless research is undertaken to reduce these uncertainties. To prioritize research needs we recommend that a value of information analysis be conducted to identify where the benefits from additional research are greatest.

Final Advisory by the Advisory Council on Clean Air Compliance Analysis on the 1999 Prospective Study of Costs and Benefits (1999) of Implementation of the Clean Air Act Amendments (CAAA)
EPA-SAB-COUNCIL-ADV-00-003

This report, from the Advisory Council on Clean Air Compliance Analysis (Council), provides peer review of the assessment of costs and benefits in the September and October 1999 drafts of an Agency document, "The Benefits and Costs of the Clean Air Act, 1990 to 2010, EPA Report to Congress" and advice for the development of future prospective studies. The Council believes that Agency document is a serious, careful study that, in general, employs sound methods and data. The

document addresses two major issues pertaining to the study's measurement of costs and representation of uncertainty regarding costs. The document also highlights six issues associated with the development of future studies:

1. Disaggregation of benefits and costs by individual provision of the Clean Air Act.
2. Characterization of uncertainties about regulatory costs, as well as uncertainties about the benefits of regulations.
3. Inclusion of tax interaction effects in discussion of costs.
4. Revision of estimates of the Value of a Statistical Life.
5. Statement of the impact of air quality regulations in terms of a Net Cost per Life Saved and a Net Cost per Life Year Saved to facilitate comparisons with other health and safety regulations.
6. Increases in the set of ecosystem benefits valued and improvements in estimates of the exposure and effects of air toxics.

An SAB Advisory on the Agency's "Total Risk Integrated Methodology" (TRIM)
EPA-SAB-EC-ADV-00-004

The Environmental Models Subcommittee of the Executive Committee reviewed the Agency's development of the Total Risk Integrated Methodology (TRIM) for predicting multimedia exposures and risks posed by hazardous air pollutants. The Subcommittee found the EPA TRIM model to be an innovative, flexible, state-of-the-art system for evaluating multimedia chemical fate, transport, exposure and risk. Specific recommendations are provided on efforts to improve the TRIM.FaTE module, planned field comparison studies of the TRIM system, and the design and implementation of the exposure and risk modules.

The Subcommittee determined that there is a need for OAQPS to better specify its plans and timeline for use of the TRIM system within the Agency and subsequent release to a broader user community. Early workshops and beta testing of the integrated TRIM system by the affected user community are recommended to help in the development of user guidance and support. The application protocol for TRIM should provide incentives for the development of improved data collection methods and improved databases for model input. For all current risk assessment models, including the TRIM system, new methods are needed to address emerging issues including: the effects of mixtures; population susceptibility and cumulative risk; and metrics for environmental equity and ecological impacts at the population level.

Advisory on the Draft Case Study Analysis of the Residual Risk of Secondary Lead Smelters
EPA-SAB-EC-ADV-00-005

The Residual Risk Subcommittee of the Science Advisory Board's (SAB) Executive Committee met on March 1-2, 2000 to review the EPA's interim draft Residual Risk Analysis on Secondary Lead Smelters.

The Subcommittee concludes that the Agency has developed a useful, self-described "work-in progress." The methodology used in this interim workproduct, as far as it currently goes, is consistent with the methodology described in the Report to Congress. Further, the assumptions used are consistent with current methods and practice. The case study provides a valuable example of how the approach presented in the Report is going to be implemented.

However, because the Subcommittee has not yet seen a full residual risk analysis and, thus, is unable to comment on the complete process, a number of important concerns were identified that should be addressed. Specifically, this interim analysis does not include the following important elements: an ecosystem risk assessment; a health risk assessment that includes populations risks; a full uncertainty/variability analysis; and a computer model for assessing multimedia transport and fate that has been adequately evaluated.

The Advisory addresses specific charge questions dealing with the following: models and model inputs, choice of receptors, ecological and human health risk assessment, uncertainty and variability assessment, and presentation of results.

Advisory on the PM2.5 Monitoring Network
EPA-SAB-CASAC-ADV-00-006

The Clean Air Scientific Advisory Committee (CASAC) provided advice and recommendations to EPA on the deployment and future plans for the $PM_{2.5}$ monitoring network, the approach to be used for the analysis of carbon species in samples collected in the chemical speciation monitoring network; and the sampling strategy for coarse particles should a coarse particle NAAQS be developed in the 2002 standard setting process. The Committee expressed its strong support for a change in the basic approach to monitoring particles in both the coarse or fine size fractions in that the emphasis should be on development of continuous monitoring methods over integrated filter methods. It is clear that there have been substantial technological developments in continuous mass monitoring approaches, and the Agency needs to move as rapidly as practical toward implementation of continuous monitoring methods of particulate matter as is now used for most of the other criteria pollutants.

LETTER REPORTS

Review of the Draft Chloroform Risk Assessment and Related Issues in the Proposed Cancer Risk Assessment Guidelines
EPA-SAB-EC-LTR-00-001

The Chloroform Risk Assessment Review Subcommittee (CRARS) of the Executive Committee met on October 27-28, 1999 to determine if significant changes need to be made to the chloroform risk assessment before it is finalized, or to the proposed Cancer Risk Assessment Guidelines' (GL) section on Mode of Action. This report addresses only suggested revisions to the Guidelines.

The Subcommittee expressed overall support for the GL's (July 1999 draft) framework for determining the importance of different modes of action and encouraged the Agency to publish the guidelines expeditiously. It was suggested that the Guidelines: a) include a step that identifies gaps in knowledge in the human relevance section;
b) amplify on what the term 'sufficient' information means when making a mode of action determination; c) clarify the specific terms are used in describing a mode of action; d) point out that the carcinogenic activity of some chemicals appears to involve both modifications of cell division and cell death processes; e) consider establishing a checklist addressing populations of concern (such as pregnant women and children), similar to that developed by FDA, to be considered in each mode of action analysis; f) state that "Consistency between endpoints related to mode of action and carcinogenic responses should be sought in experiments that give both positive and negative results. Findings that show that other chemicals having parallel toxicological properties also result in a carcinogenic response strengthen the conclusion that a particular mode of action is causal" should be added to the draft Guidelines"; and g) define more clearly the terms "linear" and "non-linear" dose-response curves.

Closure by CASAC on the Document, Air Quality Criteria for Carbon Monoxide EPA-SAB-CASAC-LTR-00-002

The Clean Air Scientific Advisory Committee (CASAC) met on November 18, 1999 to review the October 1999 draft document, *Air Quality Criteria for Carbon Monoxide* (EPA 600/P-99/001B). This was the second draft of the new carbon monoxide (CO) Criteria Document, which is being prepared as part of the review of the national Ambient Air Quality Standard (NAAQS) for CO. The first draft of the document had been reviewed by the Panel on June 9, 1999.

The Committee reached closure on the October 1999 draft document, noting that it was the unanimous view of CASAC that, after incorporation of various final changes discussed with EPA staff, the document will constitute an accurate representation of current scientific knowledge concerning the health effects of CO, and does not need to be reviewed by the Committee again. The scientific criteria contained in the final document will serve as an adequate foundation for completing the review of the appropriateness of the NAAQS for CO.

Review of the Draft Air Quality Criteria Document for Particulate Matter EPA-SAB-CASAC-LTR-003

The Clean Air Scientific Advisory Committee (CASAC) reviewed the October 1999 draft document, *Air Quality Criteria for Particulate Matter* (EPA 600/P-99/002a). This was the first review of the new draft Criteria Document (CD) for particulate matter (PM) of the new cycle for reviewing the National Ambient Air Quality Standard (NAAQS) for PM. This review focused primarily on the organization, structure, and presentation of material in the document. This approach acknowledged that additional information published before the document is finalized will be incorporated in subsequent drafts, and that there was no intent that the Panel might close on the document at this stage of its development.

The greatest overall need is to develop a more explicit strategy for selecting the information to be included, distilling key new and pre-existing information into an updated statement of current knowledge, and integrating that knowledge within a recognizable risk assessment framework that flows through the entire document. It is important that the CD focus on information that will best inform decisions on the key elements of the PM NAAQS: the indicator(s) for PM; the concentration, or level(s); the averaging time(s); and the statistical form(s). EPA faces a considerable challenge in striking a balance between inclusiveness and selectivity in portraying the burgeoning information in this field. To successfully meet that challenge, it is critical that a strategy be developed and followed consistently to maintain a focus on the information that is most key to the assessment of risk to human health and ecosystems. Rigorous adherence to a well-focused strategy will also be very critical to the timely completion of both the PM CD and Staff Paper.

Review of the SAB Report "Towards Integrated Environmental Decision-Making" EPA-SAB-EC-LTR-00-004

The Integrated Risk Project Subcommittee of the SAB reviewed the Board's "Toward Integrated Environmental Decision-Making" report and found that it successfully addressed most concerns identified during the earlier peer review. The ten Recommendations to the Agency contained are reasonable, appropriate, and worthy of sustained Agency consideration and action. The Agency will need to undertake a significantly expanded effort in developing improved tools and guidance that have been vetted with real problems in environmental decision-making. Focused research is needed on problems that range from improving methods for the informed synthesis and elicitation of public environmental values, to tools and procedures that support: improved characterization and treatment of uncertainty; reasoned science-based deliberative processes; and, the development of ordinal and cardinal evaluations of multi-dimensional risks. The challenges of improving and better integrating environmental decision-making are considerable, but the end result should be worth the effort. The Subcommittee congratulates the Integrated Risk Project Steering Committee and the SAB staff on a dramatically improved report. It is well-organized and clearly written. The "what we have"/"what we need" structure is a very useful organizing device.

Report on EPA's Draft Proposal for the Groundwater Rule EPA-SAB-DWC-LTR-00-005

The Drinking Water Committee (DWC) met on March 13-14, 2000 to review the Agency's draft proposal for its Ground Water Rule. This rule addresses the use of disinfection in ground water and other components of ground water systems to assure public health protection. This review was conducted in a public meeting in Washington, DC. EPA's draft proposal was reviewed by the Committee while it was still under review by the Office of Management and Budget and prior to being released for publication in the Federal Register as a proposed rule. As such, the DWC members recognized that specific elements were subject to change during the OMB review.

The Committee reached closure on its conclusions during the March meeting. It was the view of the Committee that: 1) both bacterial and viral indicators should be employed in ground water source monitoring plans; 2) either *E. coli* or enterococci will serve as the bacterial indicator and coliphage should be used as the viral indicator; 3) to save on costs of monitoring, the Agency should develop and validate the use of a common host to simultaneously detect both male-specific and somatic coliphage; 4) the Agency should depend upon monitoring and wellhead protection programs to ensure ground water sources are not subject to microbial contamination; and
5) source monitoring should include all ground water systems and some less frequent repeat monitoring that goes beyond the intensive monitoring proposed for the first year. These points are discussed in detail later in the letter report.

Review of the US EPA Response to Section 6102(e) of the Transportation Equity Act for the 21st Century EPA-SAB-CASAC-LTR-006

The Clean Air Scientific Advisory Committee (CASAC) reviewed EPA's response to Section 6102(e) of the Transportation Equity Act for the 21st Century, which requires the U.S. EPA to verify the performance of the sampler that was designated by 40 CFR Part 50, Appendix L (July 1997) to be the Federal Reference Method (FRM) sampler for $PM_{2.5}$. The Committee responded to the following questions: a) Has the proper methodology been used to address the requirement in the Transportation Equity Act? b) Was the methodology applied correctly? c) Is the Report's interpretation correct? and d) Has the submitted Report responded to the Congressional mandate/request as stated in the Act? In summary, the Committee concludes that, in general, the Report meets the requirements set by the Act however, it could be further strengthened by additions and changes suggested in the Committee's report. In addition, the Report should not represent a termination of testing and evaluation of monitoring methods for airborne particulate matter. A long term study of the performance of the FRM is needed to assess the quality of the data coming from the mass monitoring network.

COMMENTARIES

"Improving the Efficacy of Science Advisory Board Reviews: A Study of the Attributes of Successful Technical Reviews by the Environmental Engineering Committee"
EPA-SAB-EEC-COM-00-001

In response to the suggestion of the SAB Executive Committee, the Environmental Engineering Committee study of representative products over the past few years. The aim of the study was to develop persuasive, data-based arguments for enhancing technical reviews within the EEC and within the SAB in general.

Information was gathered by examining the impacts of eight reports of various types and discerning why some were effective and others were not. The findings were strengthened by interviewing 13 people having extensive knowledge of the SAB program and products; an additional 22 personal contacts were made concerning specific reports.

Findings and recommendations were developed in four aspects of the review process, including:

a) Topic Selection and Charge
b) Review Process
c) Report Preparation
d) Impact and Communication

Commentary on the Role of Science in New Approaches
EPA-SAB-EC-COM-00-002

This report represents self-initiated advice of the SAB regarding the role of science in "new approaches" to environmental decision-making that focus on stakeholder involvement. The Board is asking for the Administrator's support for a series of SAB workshops to discuss the role of science in approaches that rely on a high level of stakeholder involvement to address environmental issues associated with problems of specific places, specific economic sectors, or especially vulnerable populations such as children or the disadvantaged.

Commentary on the Agency's Proposed Drinking Water Standard for Radon EPA-SAB-EC-COM-00-003

The Safe Drinking Water Act (SDWA), the Agency is charged with consulting with the SAB prior to proposal of a drinking water standard, and the SAB is charged with responding as it deems appropriate. In the case of the proposed drinking water standard for radon, the SAB determined that a formal review by the Board is not necessary at this point, since over the past decade, Committees of the SAB have generated more than two dozen reports on radon, its risks, and its mitigation. After hearing an Agency briefing to the Radiation Advisory Committee earlier this month, Dr. Richard Bull (Drinking Water Committee Chair) and Dr. Janet Johnson (Radiation Advisory Committee Chair) were satisfied that the science underlying the proposed radon rule has been adequately reviewed through these numerous earlier SAB reports.

Comments on EPA's Long-Term 1 Enhanced Surface Water Treatment and Filter Backwash Rule EPA-SAB-DWC-COM-00-004

The Drinking Water Committee (DWC) met in Washington, D.C. on March 13, 2000 to review the Agency's Draft Proposal for the Long-Term 1 Enhanced Surface Water Treatment and Filter Backwash Rule (LT1FBR). The rule is intended to increase protection against microbial contamination (especially *Cryptosporidium*) in finished drinking water supplies from systems using surface water or ground water under the direct influence of surface water. The Committee conducted this review in fulfillment of its responsibilities under Section 1412(e) of the Safe Drinking Water Act (SDWA as amended in August 1996). Key points raised by the Committee include:

a. Long Term 1 Rule:

Turbidity Requirements - Combined Filter Effluent in Small Plants: EPA should outline further measures that it will take to ensure that the desired level of performance can be successfully achieved.

Turbidity Requirements - Collection of Data by Small Systems: The SAB sees no technical problem with small utilities maintaining continuous monitoring equipment that stores and reports on turbidity data at 15 minute intervals.

b. Filter Backwash Proposal

Issues of where to return the backwash flow in conventional plants: EPA should conduct studies to determine if gravity settling of washwater return flows is sufficient or if additional treatment is required. If studies reveal problems, then more specific requirements for treatment of backwash water should be considered. Based on the evidence now available, the SAB recommends against requiring that washwaters be recycled ahead of the point of coagulant addition. Based on the information currently available, the SAB recommends against requirements which would alter the design of these direct recycle processes.

Determining if a Water Treatment Plant is Exceeding Its Capacity: EPA should require monitoring of performance parameters, like settled water turbidity and filtered water turbidity instead of trying to determine capacity.
When is it Most Appropriate to Monitor? EPA should require monitoring during periods of the year when unit processes are known to perform poorly instead of focusing on high periods of demand alone.

Is Limiting the Self-assessment to Plants with Less Than 20 Filters Appropriate? EPA should require all plants to do a self-assessment, no matter how many filters they have.

Requirements for Direct Filtration Plants: EPA should study the treatment of recycled flows in direct filtration plants in order to determine the level of treatment that is appropriate in light of requirements for Cryptosporidium removal.

c. Economic Assessment

Estimating Illness Avoided: EPA should give special attention to the control of outbreaks as well as endemic disease.

Executive Committee Commentary on Residual Risk Program
EPA-SAB-EC-COM-00-005

Following its evaluation of two recent Science Advisory Board (SAB) reviews on residual risk, the SAB's Executive Committee advised EPA of potentially significant issues arising from with the Agency's efforts to implement the residual risk requirements of the Clean Air Act Amendments (CAAA) of 1990. Although the Board endorsed the Agency's plan, it raised concerns when an actual interim application of the plan was reviewed. The Board noted that, in their view, it is not clear that scientific analysis will be able to generate the type of information envisioned in the CAAA. While decisions can be made in the absence of such scientific information, they will not be sufficiently precise for the intended purpose. The Board also noted that while their concerns may turn out to be ill-founded, they recommend that the Agency and Congress seriously re-consider the current Clean Air Act Amendments mandates and their implementation strategy that depends on scientific analyses that will be resource-demanding, at a minimum, and, quite possibly, impossible to carry out in a credible manner. The Board closes by endorsing the concept of science-based decision making at the Agency, while also recognizing that no one is well served by asking science to take on an impossible task.

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TIME-TO-COMPLETION

The SAB intends that its advice should be of the highest technical quality. In addition, the Board seeks to make its advice timely, acknowledging that "advice delayed is advice derived "and" late advice is bad advice."

Clearly, some topics on the Board's agenda are more quickly addressed and expressed than are others. But on average, the Board strives to ensure that than 4 months elapses between the last substantive meeting on a issue and transmittal of the written document to the Administrator. This time includes report preparation in the EC review and final editing.

In FY 2000, the average elapsed time to completion was 5.4 months.

Please Note: The reports not included in the diagram below were internal reviews.

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Abstracts of the SAB Lecture Series - "Science & the Human Side of Environmental Protection"

Dr. Gary Machlis, University of Idaho "7% Solution", September 21, 1999

The SAB hosted the first lecture in a new series, "Science and the Human Side of Environmental Protection," on September 21, 1999. Dr. Gary Machlis, Visiting Chief Social Scientist at the National Park Service and Professor of Sociology at the University of Idaho, made a case for a "7% Solution." To an EPA audience of approximately 40 staff from Headquarters, EPA laboratories and the Regions, he talked about the critical role social science research plays in ecosystem management. He argued for a minimum floor of 7% of research dollars to be reserved for social science research. In his view, social science research is needed to reap the benefits of investments in the areas of biology, chemistry, and physical sciences. Indeed without it, Agencies are likely to face "train wrecks" or to spin in the wind of politics if they do not plan research to understand and document the human role. He urged Agency proponents to use a classic "introduction and diffusion" model to develop successful strategies that would support rigorous, peer-reviewed social science research as a robust feature of research plans in the Agency.

Following Dr. Machlis's presentation, Dr. Peter Preuss, Director of the Office of Research and Development's (ORD) National Center for Environmental Research and Quality Assurance, began the discussion by identifying the major elements of ORD's current research that incorporate social sciences: Land Use Change Models for Community Planning, Decision-Making and Valuation under the STAR Program, Water and Watersheds under the STAR Program, and Consequences of Global Climate Change. ORD is exploring possible new areas for social science emphasis, including issues associated with valuation of children's health, enforcement and deterrence, and incentives and market mechanisms. It also is developing new ways to communicate the results of social science research, e.g., workshops between Agency staff and social science grantees, a research update publication called the "STAR Report," and a new website. In response to Dr. Machlis's call for a "7% Solution," Peter estimated that ORD currently invests 3-5% of its research budget in social sciences. He asked the group to consider: (1) why EPA staff and managers endorse social science, but don't see it as a priority; (2) how ORD could better address the needs of EPA's new offices in the research planning process; and (3) what kind of mechanism would work at EPA to get agreement on the "7% Solution."

The SAB plans to host lectures on the social sciences on a periodic basis to highlight how the social sciences can help solve actual environmental problems. For more information on this series or for copies of the materials distributed by the speakers, please contact Angela Nugent (202-564-4562 or nugent.angela@epa.gov).

Dr. Eugene Rosa , Washington State University "Science and the Human Side of Environmental Protection", December 1, 1999

On Wednesday, December 1, 1999, the SAB held the second lecture in its series, "Science and the Human Side of Environmental Protection." Dr. Eugene Rosa, Edward R. Meyer Distinguished Professor of Natural Resource and Environmental Policy, at Washington State University gave a presentation entitled "Programming Your VCR and Other Technology Choices." He sketched the increasing complexity of technologies for Americans, summarized the literature on risk perceptions, and then focused on the critical role that trust plays in shaping perceptions of risks and controversies surrounding them. Thirty-four people from seven Headquarters Offices and four regions participated in the session.

Controversies can be prevented, Dr. Rosa argued, when trust fills the gap between individual knowledge and system complexity. As long as citizens trust institutions responsible for managing risks, social and democratic processes operate smoothly. He argued that trust depends on the perceived competency, fiduciary responsibility, and role of the institutions in the natural and moral order. Trust, however, is "asymmetrical;" it is easily lost, and once lost, difficult to regain.

Dr. Rosa's argument then turned to policy options for managing risky technologies. Top- down, expert-driven strategies, like those employed by the National Safety Transportation Board, work as long as trust is maintained. Education-based strategies involving risk communication can work, but are frustrated when the risk message does not match people's interests and concerns or where there is significant uncertainties. He argued that public participation strategies that view citizens as partners have the potential to be most effective to build trust in institutions.

Dr. Rosa then summarized recent significant work to advance public participation: (1) National Academy of Science Report, *Understanding Risk; Informing Decisions in a Democratic Society* 1996; and (2) Ortwin Renn et al., *Fairness and Competence in Citizen Participation - Evaluating Models for Environmental Discourse* (1995). This last edited volume provides a sample of techniques used in Europe for engaging the public, including citizen advisory panels and consensus groups.

Ms. Wendy Cleland-Hamnett, Deputy Director of the Office of Information Collection, began the discussion with an appreciation for the synthesis presented of the risk communication literature and the literature on trust. She raised several questions about the application of social science to the Agency's public involvement strategies: (1) Where should the Agency focus on building the public's knowledge on an issue? Building trust in government? or Building knowledge of trusted intermediaries?; (2) Are there different strategies to employ at the national and local levels?; and (3) Does the social science literature suggest whether EPA should present information and let people interpret it for themselves? Or should EPA also present the Agency's interpretation?

Dr. Rosa reported that social science literature suggests that building trust in the process was key. Groups become educated once they trust a process that exists. Responding to the second question, he suggested that EPA might consider different goals or strategies, depending on the question. In any case, he argued that the Agency would benefit from designing mechanisms to strengthen public involvement.

Finally, he responded to Ms. Hamnett's third question with the view that the Agency needed to take a proactive role in interpreting environmental information; providing "facts" alone would not be sufficient.

The group then began a general discussion of stakeholder involvement that emphasized the need for applied social science research. The group discussed the following needs: (1) tools and strategies to regain trust, once lost; (2) tools and knowledge about how to sustain stakeholder involvement based on progress and accomplishment, rather than crisis and conflict that tend to reduce trust; and (3) an "alert system" to identify environmental problems needing different kinds of stakeholder involvement. The group generally concluded that the need for effectively engaging the public in the Agency's work has outstripped the tools available and there was a need for more investment in effective methods and evaluation of successful efforts at stakeholder involvement.

The SAB plans to host lectures on the social sciences on a periodic basis to highlight how the social sciences can help solve actual environmental problems. For more information on this series or for copies of the materials provided by the speaker, please contact Angela Nugent (202- 564-4562 or nugent.angela@epa.gov

Dr. Baruch Fischoff, Carnegie Mellon University
"Science and the Human Side of Environmental Protection", March 1, 2000

On Wednesday, March 1, 2000, the SAB held the third lecture in its series, "Science and the Human Side of Environmental Protection." Dr. Baruch Fischhoff, University Professor, Engineering and Public Policy and Social and Decision Sciences at Carnegie Mellon University, gave a presentation entitled "Scientific Standards for Public Involvement in Environmental Decisions." He described how research in the growing field of integrated assessment can help EPA improve the quality of information provided to individuals and the public. The information provided can encourage effective private choices related to environmental issues and public participation in environmental decision making. Thirty-eight people from eight Headquarters Offices and four regions participated in the session.

Dr. Fischhoff began the talk by describing the tension between, on the one hand, increasing calls for public participation in risk-related decision making by EPA, the National Institutes of Health, the Institute of Medicine, the National Research Council and other major organizations and, on the other hand, continuing skepticism among policy practitioners about public competence to participate meaningfully. He argued that psychological research suggested an approach for engaging the public appropriately. Research shows that users of information want integrated information that matches their information needs before they are asked to respond to a question or make a decision.

He described research, case studies, and tools in the area of integrated assessment to suggest an approach for matching information with those needs. One tool is the "influence diagram," which represents experts' views of what information is needed to understand an environmental problem and how those factors interrelate. The experts' views are compared to what individuals know already at both the experiential and cognitive levels. He explained how such an analysis was used to provide advice to the American Water Works Association Research Foundation regarding communication strategies during a

cryptosporidium outbreak. A multidisciplinary team built an influence diagram to identify the variety of factors that needed to be understood in order to predict and control exposures. They discovered that the real-time needs of the initial intended user of the risk communication made much of the information about consumers' behavior irrelevant. By the time a significant exposure to cryptosporidium was identified, the outbreak would have peaked and consumer controls such as boiling water would be of relatively little use. The "influence diagram" instead could be used to show the value of investing in improved detection methodologies or could be used as a basis for public discussions for managing upstream contamination or disinfection. It allows the calculation of the value of effective risk communications, once better surveillance systems were in place.

Dr. Fischhoff then turned to methods for identifying individuals' information needs. He argued that research in psychology indicated that many public health and environmental choices presented to individuals posed questions about preferences that had not been formed yet or asked respondents to relate to unfamiliar tasks, to unfamiliar worlds, or to a vision of themselves in the future that they had not yet fully imagined. He described research in a variety of contexts (e.g., public health preventive programs addressing sexually transmitted diseases among adolescent women, analysis of the experience of communities conducting comparative risk processes) that is taking a systematic approach to identifying what people know already and relating that information to experts' views on what information matters.

He closed the presentation by suggesting that Agencies' conscious efforts to "get the information right" to users was a way of building trust in risk management.

Mr. David Davis, Deputy Director of the Office of Wetlands, Oceans and Watersheds (OWOW), had been previously invited to open the discussion with observations and questions Mr. Davis began the discussion with comments addressing how the approaches Dr. Fischhoff presented might be applied to the work of EPA programs, using aspects of his own office as examples, where applicable. He pointed to "confounding factors" that made it difficult to apply the integrated assessment tools and communication tools described and made four major points: (1) he suggested that the methods might be more difficult to apply to risks to ecosystems, rather than human health risks to individuals, because the risks were more distant and more diffuse; (2) he indicated that many environmental protection issues tap individuals' deeply held philosophical beliefs regarding such issues as property rights and the proper role of government. EPA's communication efforts occur in a context where there are complex filters interjected because of individuals' fundamental beliefs that have little relevance to the science issues *per se*; (3) he suggested that EPA's own efforts to communicate are confused by a lack of clarity concerning the intended audience and a reluctance to choose priorities among audiences; and (4) he asked how the "integrated assessment" approach applied to EPA communications, where often the information provided is not solely science, but a mixture of science, policy, and often politics.

Dr. Fischhoff responded that the integrated assessment approach can incorporate information about politics, policy and other institutional factors. He argued that it would be appropriate to include those factors in analysis because users of information need to understand the institutional context for decisions. He suggested that research in new areas, such as environmental psychology, was making progress in understanding how people value ecosystems and how those preferences are formed and can be shaped by additional information. He acknowledged that some situations involving matters of faith and ideology cannot be influenced by providing information and are amenable only to a political solution. He cautioned, though, that it would be appropriate to use a scientific approach to alternative framing of issues to see if participants might be willing to envision the implications of alternative choices that would

make them more amenable "to deal." He closed with some comments on the issue of communicating with multiple audiences. Research has shown that users of information value the ability control of the level of detail provided. Tools such as brochures with tiered information or DVDs and Internet sites offering different kinds of information for different users can allow multiple communication strategies with a single product. The key, he emphasized, was designing information to appeal to individuals, not groups; to identify the kinds of individuals who need information and the heterogeneity of those groups; and to identify the specifics of what those kinds of individuals need to know but currently don't.

Questions then came from the general audience regarding the implications of industrial ecology for framing the kinds of questions asked and information provided to users; whether the integrated assessment model assumed that experts had the authority to frame issues and define information needed; and whether the dynamics of social decision-making processes changed the information to be provided to a group or how that information should be provided.

The SAB plans to host lectures on the social sciences on a periodic basis to highlight how the social sciences can help solve actual environmental problems. For more information on this series or for bibliographic references provided by the speaker, including his paper "Communicate unto others...," *Reliability Engineering and System Safety*, 59 (1998), pp. 63-72. please contact Angela Nugent (202-564-4562 or nugent.angela@epa.gov).

Dr. Everett Rogers, University of New Mexico
"Science and the Human Side of Environmental Protection", May 31, 2000

On Wednesday, May 31, 2000, the SAB held the fourth lecture in its series, "Science and the Human Side of Environmental Protection." Dr. Everett Rogers, Regents' Professor, Department of Communication and Journalism, University of New Mexico, and Visiting Professor in the Center for Communications Programs, School of Public Health, Johns Hopkins University (1999-2000), gave a presentation entitled "The Diffusion of Environmental Innovations." Thirty-four people from six Headquarters Offices and two regions and an Office of Research and Development laboratory participated in the session.

Dr. Rogers presented a framework for understanding innovations that he describes in his book, "The Diffusion of Innovations." He defined diffusion as a process by which an innovation is communicated through certain channels over time among members of a social system. He described his framework as having three main components that are standard across thousands of different kinds of innovations introduced at different times and different cultures: (1) a decision process that involves the following steps: knowledge, persuasion, decision, implementation and confirmation; (2) characteristics that are common to successful innovations: relative advantage, compatibility, acceptable levels of complexity, trialability, observability, and potential for reinvention; and (3) a social system where individuals break out into the following groups, each with distinctive characteristics: innovators, early adopters, early majority, late majority and laggards. He argued that research in a variety of academic fields has identified an "s-

shaped curve" that describes the rate of innovation. In every successful innovation there is a key point where there are sufficient adopters that further diffusion is self sustaining. He described case examples as different as the adoption of different typewriter interfaces, hybrid seed corn, and testing to prevent exposure to cryptosporidium during a drinking water emergency to illustrate his framework.

Mr. Robert Brenner, Principal Deputy Assistant Administrator in the Office of Air and Radiation, had been previously invited to open the discussion with observations and questions. He suggested that Dr. Roger's model provided a focused, organized opportunity to think through how the Agency might implement innovative. He suggested that Project XL provided an example of the Agency working with innovators to demonstrate new approaches that could be adopted more broadly. He wondered how the characteristics of one innovative approach, such as recycling, helped it diffuse relatively successfully, while others like inspection and maintenance programs and the use of catalysts did not, and how the Agency could learn lessons from those cases and others. He also challenged the Agency to consider how to reach out to environmental justice communities to accelerate the process of innovation and how to ensure that beneficial innovations are perceived as having a "relative advantage" in the view of potential adopters.

Questions then came from the general audience about the particular characteristics of different social groups in the adoption process, and strategies for how the Agency might accelerate the "s-curve" standard to the adoption process. The group discussed working with opinion leaders and changing perceptions over time through conscious use of communication networks. A question from the regional audience addressed the special problem of innovation in EPA regions. Dr. Rogers responded that, depending on the freedom possessed by the Regions, there may be patterns influenced by internal social processes, EPA Headquarters, or dynamics where some EPA regions may assume innovator roles within EPA's 10-region structure. One question challenged Dr. Rogers to address the unspoken role of accidents, random and chance events in the Framework and Dr. Rogers acknowledged the need to do so in the next edition of his book. The final question addressed innovations within organizations. Dr. Rogers suggested that the most likely dynamic would be an "s-shaped" curve identifying the critical zone where each individual would know enough people similar to themselves who have adopted the innovation.

The SAB plans to host lectures on the social sciences on a periodic basis to highlight how the social sciences can help solve actual environmental problems. If you have suggestions for future speakers or topics, please contact Angela Nugent (202-564-4562 or nugent.angela@epa.gov).

APPENDIX C

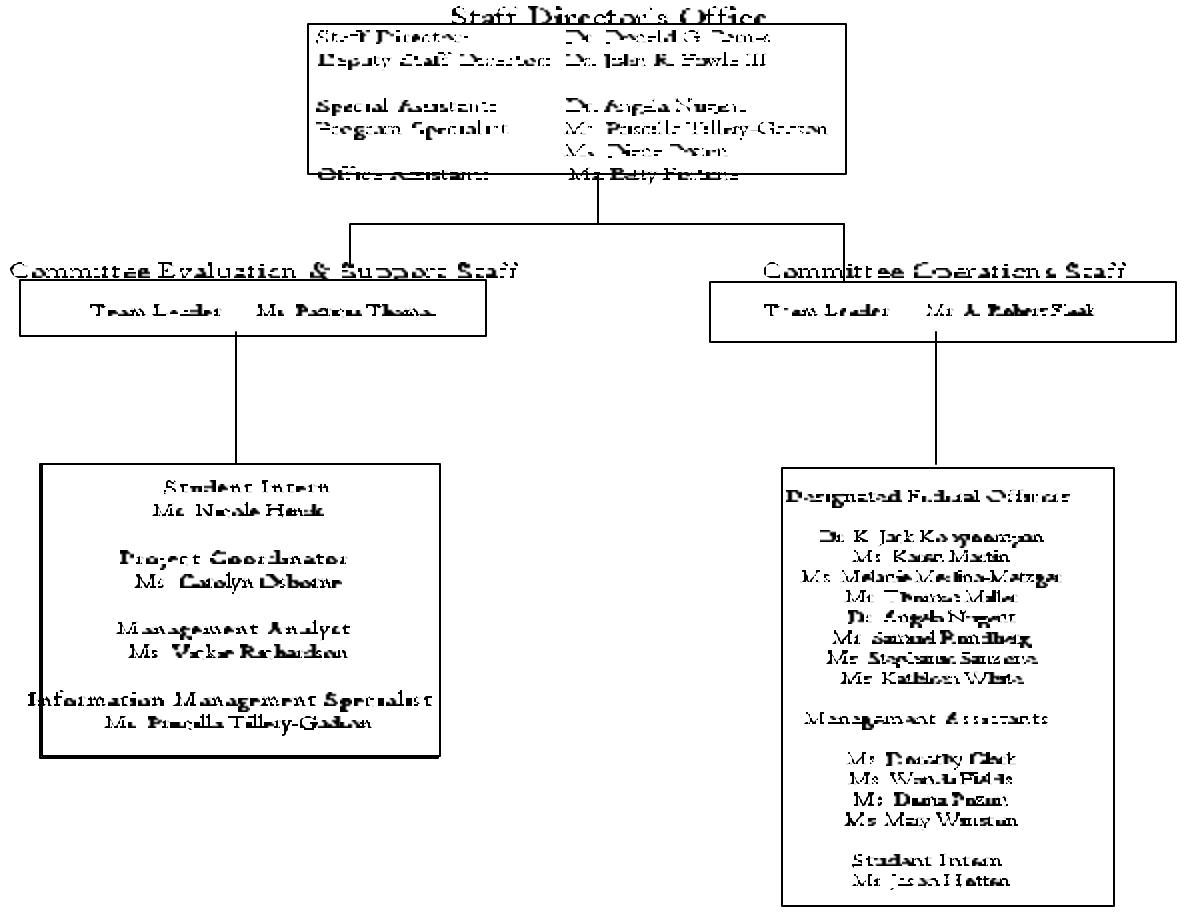
SAB PEOPLE

C1. Staff Organization Chart
C2. Staff Committee Alignment
C3. SAB Committee Chairs
C4. Guidelines for Service on the SAB
C5. Types of Affiliation with the SAB
C6. SAB Members for FY 2000
C7. SAB Consultations for FY 2000
C8. Staff Biographical Sketches & Staff Transitions

C1

SAB STAFF ORGANIZATION CHART

Some of the following positions were filled by two people during the year as changes in personnel or staff alignments were made. Where two people occupied a position during the year, both are listed. The later name is the incumbent at the close of FY 2005.



C2

FY 2000 STAFF-COMMITTEE ALIGNMENT

Committee	Chair	Designated Federal Officer	Management Assistant (unless otherwise noted)
Executive Committee	Dr. Joan Daisey Dr. Morton Lippmann	Dr. Donald G. Barnes	Ms. Priscilla Tillery-Gadson Ms. Diana Pozun (Program Specialist)
Integrated Risk Steering Subcommittee of the Executive Committee	Dr. Joan Daisey Dr. Morton Lippmann	Ms. Stephanie Sanzone	Ms. Wanda Fields
Advisory Council on Clean Air Compliance Analysis	Dr. Maureen Cropper	Dr. Angela Nugent	Ms. Diana Pozun
Clean Air Scientific Advisory Committee	Dr. Joe Mauderly	Mr. A. Robert Flaak	Ms. Diana Pozun
Drinking Water Committee	Dr. Richard Bull	Mr. Thomas Miller	Ms. Dorothy Clark
Ecological Processes and Effects Committee	Dr. Terry Young	Ms. Stephanie Sanzone	Ms. Mary Winston
Environmental Economics Advisory Committee	Dr. Robert Stavins	Mr. Thomas Miller	Ms. Dorothy Clark
Environmental Engineering Committee	Dr. Hilary Inyang	Ms. Kathleen White	Ms. Mary Winston
Environmental Health Committee	Dr. Mark Utell	Mr. Samuel Rondberg	Ms. Wanda Fields
Integrated Human Exposure Committee	Dr. Henry Anderson	Mr. Samuel Rondberg	Ms. Wanda Fields
Radiation Advisory Committee	Dr. Janet Johnson	Dr. K. Jack Kooyoomjian Ms. Melanie Medina-Metzger	Ms. Diana Pozun
Research Strategies Advisory Committee	Dr. W. Randall Seeker	Dr. John R. Fowle III	Ms. Mary Winston

C3

SAB COMMITTEE CHAIRS

Executive Committee (EC)

***Dr. Joan Daisey** **

Head, Center for Atmospheric and Biospheric Effects Technology, Lawrence Berkeley Laboratory
Member, American Chemical Society
Member, American Association for Aerosol Research
Member, Air Pollution Control Association
Member, International Society of Exposure Analysis
Member, Editorial Review Board Aerosol Science and Technology

*deceased February, 2000

Executive Committee (EC)

Dr. Morton Lippman, Interim Chair

Professor of Environmental Medicine, New York University School of Medicine
Director, Human Exposure and Health Effects Research Program
Director, EPA Center for Research on Health Effects of Particulate Matter
Member, American Academy of Industrial Hygiene
Member, American Industrial Hygiene Association
Member, American Conference of Governmental Industrial Hygienists
Member, American Association for Aerosol Research
Member, International Society for Environmental Epidemiology
Member, International Society of Exposure Analysis
Member, Editorial Board, Archives of Environmental Health
Member, Editorial Advisory Board, Applied Occupational Environmental Hygiene
Member, Committee on Toxicology, Board of Environmental Studies and Toxicology, National Research Council
Member, Environmental Health Sciences Center, External Advisory Committee UMDNJ-Rutgers, NJ
Member, Advisory Committee - Consortium for Risk Evaluation with Stakeholder Participation, UMDNJ, NJ
Member, Board of Directors, Northeast States Clean Air Foundation, Boston, MA
Member, Owens Corning Science Advisory Board, OH
Member, Laborers-AGC Hazardous Waste Workers Training Center, External Advisory

Committee, CT
Member, NJ-NY Waste Workers Training Center, External Advisory Committee, NJ
Chair, USC-Chronic Effects of Ambient Air Pollutants in Southern California, External Advisory Committee
Chair, National Environmental Respiratory Center, External Scientific Advisory Committee, NM

Advisory Council on Clean Air Compliance Analysis (Council)

Dr. Maureen Cropper

Professor of Economics, University of Maryland
Lead Economist, Research Development, The World Bank
Editorial Board, Journal of Economic Perspectives
Editorial Board, Resource and Energy Economics
Advisory Committee, Center for Risk Analysis, Harvard University
Advisory Committee, Donald Bren School of the Environment, University of California, Santa Barbara

Clean Air Scientific Advisory Committee (CASAC)

Dr. Joe Mauderly

Vice President and Senior Scientist, Lovelace Respiratory Research Institute
Director, National Environmental Respiratory Center
Research Professor of Medicine and Pharmacy, University of New Mexico
Member, American Thoracic Society
Member, Society of Toxicology
Member, American Physiological Society
Member Air and Waste Management Association
Member, American Association for the Advancement of Sciences
Member, American Veterinary Medical Association
Member, Editorial Board of Experimental Lung Research
Member, Editorial Board of Inhalation Toxicology

Drinking Water Committee (DWC)

Dr. Richard Bull

Senior Staff Scientist, Pacific Northwest National Laboratory, managed by Battelle
Member, American Association for the Advancement of Science
Member, Sigma Xi
Member, American Society for Pharmacology and Experimental Therapeutics
Member, Society of Toxicology
Member, American Association for Cancer Research

Member, American Water Works Association
Member, International Society for the Study of Xenobiotics
Member, Editorial Board of Toxicology
Member, Editorial Board of the Journal of Toxicology and Environmental Health
Member, National Research Council Committee Spacecraft Maximum Contaminant Limits
Member, Science Advisory Panel for Santa Anna River Water Quality and Health Study
Member, Bromide Expert Panel for the CAL-FED Program on the Sacramento River Delta

Ecological Processes and Effects Committee (EPEC)

Dr. Terry Young

Senior Consulting Scientist, Environmental Defense, Oakland, CA

Environmental Economics Advisory Committee (EEAC)

Dr. Robert Stavins

Albert Pratt Professor of Business and Government, and Faculty Chair, Environment and Natural Resources Program, John F. Kennedy School of Government, Harvard University
University Fellow, Resources for the Future
Member, EPA Clean Air Act Advisory Committee
Lead Author, Intergovernmental Panel on Climate Change
Member, Board of Directors, Robert and Renée Belfer Center for Science and International Affairs
Member, Executive Committee, Harvard University Committee on Environment
Member, Board of Academic Advisors, AEI-Brookings Joint Center for Regulatory Studies
Member Editorial Council, The Journal of Environmental Economics and Management
Member, Board of Editors, Resource and Energy Economics
Member, Advisory Board, Environmental Economics Abstracts
Member, Editorial Board, Economic Issues
Contributing Editor, Environment

Environmental Engineering Committee (EEC)

Dr. Hilary Inyang

Duke Energy Endowed Distinguished Professor, Professor of Earth Sciences and Director, Geoenvironmental and Energy Systems Research Laboratory (GESRL), University of North Carolina, Charlotte.
Member, Effluent Guidelines Committee, National Advisory Council on Environmental Policy and Technology
Fellow, Geological Society of London
Honorary Theme Editor, United Nations Encyclopedia of Life Support Systems, Section of

Environmental Monitoring
Associate Editor, Journal of Environmental Engineering (American Society of Civil Engineers), Waste Management Journal (Elsevier Science Publishers), International Journal of Surface Mining, Reclamation and the Environment (A.A. Balkema Publishers)
Editorial Board Member, Waste Management and Research (Academic Press); Journal of Infrastructure Systems (ASCE); Journal of Environmental Systems (Baywood Publishers); Journal of Soil Contamination; Transactions of the Nigerian Society for Biological Conservation; Environmental Monitoring and Assessment (Kluwer Academic Publishers); and Resources Conservation and Recycling (Elsevier Science Publishers)
1996-99 DuPont Young Professor
1996 Young Investigator, National Research Council
1992/93 Eisenhower-Jennings Randolph Awardee of the World Affairs Council/International Public Works Federation
1991 American Association for the Advancement of Science (AAAS)/USEPA Environmental Science and Engineering Fellow

Environmental Health Committee (EHC)

Dr. Mark Utell

Professor of Medicine and Environmental Medicine, University of Rochester School of Medicine, Rochester, N.Y.
Director, Pulmonary/Critical Care and Occupational Medicine Divisions, University of Rochester Medical Center
Associate Chair, Department of Environmental Medicine, University of Rochester Medical Center
Diplomate of the American Board of Internal Medicine,
Diplomate of the American Board of Internal Medicine, Pulmonary Diseases Sub-specialty
Fellow, American Association for the Advancement of Science
Fellow, American College of Chest Physicians
Fellow, American College of Physicians
Editorial Board: Annals of Internal Medicine, Journal of Aerosol Medicine Inhalation Toxicology, Environmental Health Perspectives and Journal of Environmental Medicine

Integrated Human Exposure Committee (IHEC)

Dr. Henry Anderson

Chief Medical Officer and State Environmental and Occupational Health Epidemiologist, Wisconsin Division of Public Health
Adjunct Professor, Dept of Preveintive Medicine, Univ Wisconsin Medical School
Certified in Preventive Medicine, American Board of Preventative Medicine
Certified Specialist in Occupational and Environmental Medicine, American Board of Preventative Medicine

Fellow, American College of Epidemiology
Fellow, American Association for Advancement of Science
Member, American Public Health Association
Member, American College of Epidemiology
Member, American Medical Association
Member, American Occupational and Environmental Medicine Association
Member, Council of State and Territorial Epidemiologists
Member, International Society of Environmental Epidemiology
Menber, Collegium Ramazzini
Member, Editorial Board, Cancer Prevention International
Associate Editor, American Journal of Industrial Medicine
Co-Editor, Wisconsin Medical Journal Public Health Column

Radiation Advisory Committee (RAC)

Dr. Janet Johnson

Senior Technical Advisor, Shepherd Miller, Inc.
Affiliate Faculty, Department of Environmental Health, Colorado State University
Board of Directors, Health Physics Society
President, Radon Section, Health Physics Society
Member, Colorado Radiation Advisory Committee
Member, American Academy of Health Physics
Member, American Industrial Hygiene Association
Member, American Academy of Industrial Hygiene

Research Strategies Advisory Committee (RSAC)

Dr. W. Randall Seeker

Senior Vice President, GE Energy and Environmental Research Corporation
Member, American Institute of Chemical Engineers
Member, American Society of Mechanical Engineers
Member, Combustion Institute

C4

GUIDELINES FOR SERVICE ON THE SAB

Background

The Science Advisory Board (SAB) was established in 1974 by the Administrator. In 1978 the SAB received a Congressional mandate to serve as an independent source of scientific and engineering advice to the EPA Administrator.

The SAB consists of approximately 100 Members, who are appointed by the Administrator. These members serve on specific standing committees. The Chairs of the Committees also serve as members of the Executive Committee, which oversees all of the activities of the Board.

In many of its activities, the members of the Board are supplemented by Consultants, who are appointed by the SAB Staff Director after conferring with the Chair of the Committee on which the consultant is to serve. Also, on occasion, Panels will be supplemented by "liaison members" from other governmental agencies. These people are invited by the Staff Director to participate in an ad hoc manner in order to bring their particular expertise to bear on a matter before the Board.

Both the Executive Committee and the permanent Committees may choose to conduct issue-specific business through Subcommittees that are chaired by SAB members. Reports from Subcommittees are reviewed by the respective permanent Committees. The Executive Committee reviews all reports, independent of their origin, prior to formal transmission to the Administrator. The sole exceptions are reports from the Clean Air Scientific Advisory Committee and the Advisory Council on Clean Air Compliance Analysis, which are separately chartered Federal Advisory Committees operating within the SAB structure.

Criteria for Selection of Members and Consultants

The SAB is chartered as a Federal Advisory Committee, subject to the rules and regulations of the Federal Advisory Committee Act (FACA) (Public Law 92-463). The charter provides guidance and restrictions on selection of SAB members. The four most significant of which are:

a) Members must be qualified by education, training and experience to evaluate scientific and technical information on matters referred to the Board.

b) The composition of Board committees, subcommittees and panels must be "balanced",

representing a range of legitimate technical opinion on the matter.

c) No member of the Board may be a full-time government employee.

d) Members are subject to conflict-of-interest regulations.

The scientific and technical quality and the credibility of those selected is a paramount consideration. Secondary factors considered include the geographic, ethnic, gender, and academic / private sector balance of committees. Other factors that contribute to, but do not determine, the selection include demonstrated ability to work well in a committee process, write well, and complete assignments punctually.

Nominations for membership / consultantship on the Board are accepted at any time. On a biannual basis, the SAB Staff Office publishes a notice in the Federal Register formally soliciting the names of candidates for SAB activities.

Terms of Appointment

Members serve at the pleasure and by appointment of the Administrator. In order to provide suitable terms of service and to insure the infusion of new talent, the following guidelines are generally followed:

Members are generally appointed in October for two-year terms which may be renewed for two additional consecutive terms. Chairs of the standing committees are also appointed for two-year terms which may be renewed for one additional term. If a member is appointed as Chair, this term of service (2-4 years) is added to whatever term of service he / she may accrue as a member. For example,

Years as member	Followed by years as Chair	Followed by year as member	Total years
2	0	0	2
2	2 or 4	0 or 2	4-6
4	2 or 4	0	6-8
6	2 or 4	0	8-10

Reappointment as a member is possible after a two-year hiatus from the SAB, during which time the individual may be called upon to serve as a consultant for a specific issue.

Consultants are appointed to provide the necessary expertise for specific issues. Their terms of appointment are for one year, beginning at any time, and are renewable annually. Their formal appointments may be continued beyond completion of a given project so that their expertise can be quickly assessed in

future with a minimum of paperwork.

In general, interagency liaisons participate for the term of issue resolution only.

Member and Consultant Selection Process

Members are appointed by the Administrator based on nominations forwarded by the SAB Staff Director and the Chair of the Executive Committee. These nominations, in turn, are based on recommendations made by the Designated Federal Official (DFO–the member of the SAB Staff with principal responsibility for servicing standing Committees) and the Chairs of the standing Committees. The DFO has the responsibility for developing a list of candidates, utilizing all credible sources, including members of the SAB, other DFOs, EPA staff, staff at the National Academy of Sciences \ National Research Council, trade groups, environmental groups, professional organizations, scientific societies, regulated industries, and the informed public.

On occasion, an *ad hoc* Membership Subcommittee of the Executive Committee has been established to assist in the selection process. This group is consulted about possible names and used as a "sounding board" when decisions are being made about appointments. The Membership Subcommittee's principal role is to maintain the integrity of the process and to probe the extent to which objective selection criteria and procedures are being followed. They also raise questions about adherence to the Statement of Intent on Women and Minorities, adopted by the Executive Committee in 1990, which was designed to increase the representation of these groups on the Board.

Consultants are appointed by the Staff Director following a similar procedure.

Panel Selection Process

In general, once the Board and the Agency have agreed upon a topic for SAB review, the subject is assigned to one of the standing Committees. The Committee Chair and the DFO have primary responsibility for forming a review Panel (the full Committee or a Subcommittee, as the case may be.) The Panel will contain some or all members of the Committee. In many instances, consultants may also be added to the Panel in order to obtain specialized expertise on the particular issue under discussion.

A key aspect in the Panel selection process is the "charge", the mutually agreed upon description of what the Agency would like the review to accomplish and / or what the SAB expects to focus upon. The most helpful charge is one that prescribes specific areas / questions that need attention and / or answers. At a minimum, the elements of the charge should be sufficiently precise that the SAB can determine what additional consultant expertise is needed to conduct the most helpful review.

Often the DFO begins by soliciting ideas about potential members from the Agency staff who are intimately acquainted with the issue and will therefore are often aware of the most informed people. A

conscious effort is made to avoid selecting individuals who have had a substantive hand in the development of the document to be reviewed. At the same time, experience has shown the utility of having some representation from individuals/groups who may have been involved in prior reviews of the issue or the document. The goal is to minimize the appearance or practice of an individual's reviewing his/her own work, while at the same time, maintaining an historical link to earlier deliberations surrounding the document/issue. Once the Agency staff has suggested nominees and provided background information on the individuals, their direct role in the panel selection process is complete. Agency staff, the requesting office, and others may be consulted at a later stage for information about nominees received from other sources.

The goal is to gather a balanced group of experts who can provide an independent assessment of the technical matters before the Board. Discrete inquiries about the nominees are made with a number of different sources. This might include, for example, making inquiries with editors of newsletters, professional colleagues, and experts who are on "the other side" of the issue. As time and resources permit and controversy demands, names of nominees will be investigated via computer search of their publications and pronouncements in public meetings.

Frequently, a determining factor for selection is the availability of the individual to participate in the public review. In the case of multiple-meeting reviews, the SAB may enlist the assistance of a particularly skilled consultant who cannot attend all meetings, but who is willing to do additional homework and/or participate via conference call.

In some cases, the Panel Chair consults with key members of the Panel for their advice before completing the empaneling process. The final selections for consultants are compiled by the DFO in conjunction with the Chair of the Panel and are submitted to the SAB Staff Director for discussion and appointment.

Conflict-of-Interest and Public Disclosure

The intent of FACA is to construct a panel of knowledgeable individuals who are free of conflicts-of-interest. In this regard, each Panel member must complete a confidential financial information form that is reviewed by the Deputy Ethics Officer, Donald Barnes, to determine whether there are any obvious conflicts-of-interest.

Legal conflict-of-interests generally arise in connection with **?**particular party matters" (A particular matter is any activity in which an employee participates in an official capacity, where he or other persons have a financial interest, if the direct activity --particular matter-- will have a direct and predictable effect on his own or that person's financial interests.) In general, the SAB (in contrast with the FIFRA Scientific Advisory Panel (SAP)) does not get involved in **?**particular party matters," hence, legal conflicts-of-interest are rare on the SAB. However, technical conflicts-of-interest can arise, particularly for participants from academic institutions, in connection with Committee recommendations for additional research studies. In most such cases, the DFO's work with the Committee members to apply for waivers from the conflict-of-interest

concerns on this matter. The requests for waivers are evaluated on a case-by-case basis by EPA's Office of the General Counsel. (The Agency generally determines that the benefits to the country derived from these experts' recommendations for additional research, outweigh any technical conflict-of-interest that might be involved.)

However, the Board is also concerned about "apparent conflicts-of-interest." Consequently, Members and Consultants to the Panel are generally selected from the "broad middle" spectrum of opinion on the technical issue under discussion. Experience has shown that achieving balance through equal representation of extreme views reduces the chance of achieving a workable consensus--pro or con--that the Agency needs to move forward.

The "public disclosure" (see Attached) process (a standard part of all SAB Committee meetings) is a mechanism aimed resolving the apparent conflicts-of-interest issues. This procedure involves an oral statement (sometimes Board members supplement this with a written document) that lays out the individual's connection with the issue under discussion; e.g., his/her area of expertise, length of experience with the issue, sources of research grants, previous appearance in public forms where he/she might have expressed an opinion, etc. This recitation of prior and/or continuing contacts on the issue assists the public, the Agency, and fellow Panel members understand the background from which particular individual's comments spring, so that those comments can be evaluated accordingly.

Conclusion

These Guidelines are intended to assist the SAB in adhering to the mandates and spirit of the Federal Advisory Committee Act. By following these Guidelines the Board should be well-positioned to provide technically-sound, independent, balanced advice to the Agency. At the same time, they provide assurance that there will be adequate participation by and renewal with well-qualified experts from the various communities served by the Board.

Prepared: Oct 14, 1991
Revised: Nov 26, 1991
Revised: Oct. 12, 1994
Revised: Nov 12, 1996

ATTACHMENT

ATTACHMENT TO APPENDIX C4

GUIDELINES FOR PUBLIC DISCLOSURE AT SAB MEETINGS

Background

Conflict-of-interest (COI) statutes and regulations are aimed at preventing individuals from (knowingly or unknowingly) bringing inappropriate influence to bear on Agency decisions which might affect the financial interests of those individuals. The SAB contributes to the decision-making process of the Agency by evaluating the technical underpinnings upon which rules and regulations are built. SAB Members and consultants (M/Cs) carry our their duties as Special Government Employees (SGE's) and are subject to the COI regulations.

Therefore, in order to protect the integrity of the advisory process itself and the reputations of those involved, procedures have been established to prevent actual COI and minimize the possibility of perceived COI. These procedures include the following:

a) Having M/C's file, at the time of appointment, OGE Form 450, Confidential Statement of Employment and Financial Interest. This form is a legal requirement and is maintained by the Agency as a confidential document.

b) Providing M/C's with written material; e.g. copies of the Effect of Special Government Employee Status on Applicability of Criminal Conflict of Interest Statutes and Other Ethics Related Provisions, the Standard of Ethical Conduct Synopsis and Ethics Advisories 97-01 and 96-18.

c) Delivering briefings to M/C's on COI issues on a regular basis.

The following is a description of an additional voluntary[1] procedure that is designed to allow both fellow M/Cs and the observing public to learn more about the backgrounds that M/C's bring to a discussion of a particular issue. In this way, all parties will gain a broader understanding of "where people are coming from" and provide additional insights to help observers and participants evaluate comments made during the discussion.

Procedure

[1] Note: The disclosure procedure is voluntary, and members/consultants are not obligated to reveal information contained in their Form 450 that would otherwise remain confidential.

When an agenda item is introduced that has the potential for COI–actual or perceived--the Designated Federal Official (DFO) will ask each M/C on the panel to speak for the record on his/her background, experience, and interests that relate to the issue at hand. The following items are examples of the type of material that is appropriate to mention in such a disclosure:

a) Research conducted on the matter.

b) Previous pronouncements made on the matter.

c) Interests of employer in the matter.

d) A general description of any other financial interests in the matter: e.g., having investments that might be directly affected by the matter.

e) Other links: e.g., research grants from parties--including EPA--that would be affected by the matter.

The DFO will also publicly refer to any waivers from the COI regulations which have been granted for the purposes of the meeting.

The DFO will assure that the minutes of the meeting reflect that fact such disclosures were made and, if possible, the nature of the disclosures. In addition, the minutes should describe any situations in which, in the opinion of the DFO, an actual or perceived COI existed and how the issue was resolved.

C5

TYPES OF AFFILIATION WITH THE SAB

1. SAB Members

SAB members are technically qualified individuals who are appointed to the Board by the Deputy Administrator for two-year terms. Members participate fully in their review committees, which are generally conducted in a collegial, consensus-building style. Their names appear as members on relevant rosters and generated reports.

Note that SAB reports are formally endorsed by SAB members by action of the Executive Committee.

2. SAB Consultants

SAB Consultants are technically qualified individuals who are appointed to the Board by the SAB Staff Director for one-year terms. Generally, Consultants are appointed in order to augment the expertise for a particular review and/or for mutual exploration of future membership on the Board. Consultants participate fully in their review panels and committees, which are generally conducted in a collegial, consensus-building style. Their names appear as Consultants on relevant rosters and generated reports.

3. Federal Experts

The SAB charter precludes Federal employees from being members of the Board. However, in some instances, certain Federal experts have technical knowledge and expertise that can add significant value of the work of the SAB.

In order to access that expertise for the benefit of the Board and the Administrator, the SAB staff will work with the Office of the General Counsel to identify appropriate mechanisms for assessing the potential for conflicts of interest.

The SAB Staff Director can invite Federal experts who do not have a real or apparent conflict-of-interest (either personally or through their agencies) to service on an SAB committee for the duration of a particular the review/study. Federal Experts participate fully on the committees, which are generally conducted in a collegial, consensus-building style. Their names appear as Federal Experts on relevant rosters and generated reports.

4. Invited Expert Resource

In some situations, there are individuals (both Federal employees and non-Federal employees) who have expertise and/or knowledge of data that bears on an SAB review but who also have real or perceived COIs that would preclude their participation as Members or Consultants. There people can attend the SAB meeting as Invited Expert Resources. The SAB pays travel expenses, if needed.

For example, the person could be the author of a key study of PCBs when the EHC is reviewing the Agency's reference dose for PCBs. The SAB would fund the travel expenses for the person. This person could be either Federal or non-Federal employee. The intent is to have a source real-time, authoritative feedback available during the SAB discussion of the issue. The person would not be asked to serve as a consultant in this case, due to a professional conflict-of-interest; i.e., he would be placed in the position of reviewing his own work.

Another example would be a researcher who has access to some important data, alternative analysis, etc. at another agency, but that is germane to the SAB review. The person would not be asked to serve as a consultant in this case because of a real or apparent conflict-of-interest; e.g., works for an organization (private or Federal) that would be so directly impacted by the Agency's position as to cause a M/C from such an organization to ask for a recusal.

Invited Expert Resources have limited participation in SAB reviews. They are available to answer questions of the SAB committee panel, provide invited presentations, and enlighten the discussion with pertinent pieces of information. Their names are listed as Invited Expert Resources on rosters and reports, with an explanatory footnote recording their presence and role at the meeting. They are not a part of the Board's consensus/decision about the report. The intent is to indicate that such experts were available during the meeting, but that they were not a party to the judgment.

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C8

STAFF BIOGRAPHICAL SKETCHES & TRANSITIONS

DR. DONALD G. BARNES

STAFF DIRECTOR

DESIGNATED FEDERAL OFFICER FOR THE EXECUTIVE COMMITTEE

DR. DONALD G. BARNES assumed his position as Staff Director in 1988. Since arriving, he has overseen a 25% growth in the Committees of the Board and a 50% increase in the membership of the Board. During his tenure the Board has completed four major de novo reports [Future Risk (1988), Reducing Risk (1990), Beyond the Horizon (1995), and Toward Integrated Environmental Decision-making (2000)] and two self-studies (1989 and 1994), in addition to more than 300 reports to the Administrator.

Dr. Barnes is active in Agency-wide issues associated with science and risk assessment. For example, he serves on the Administrator's Science Policy Council and on the Steering Committee for the Council.

Dr. Barnes came to the SAB following ten years' service as Senior Science Advisor to the Assistant Administrator for Pesticides and Toxic Substances. In that role, he became involved with a number of controversial issues; e.g., pesticide re-registrations, the implementation of Section 5 of TSCA, and "dioxin", for which he received two EPA Gold Medals for Superior Service.

He has been active in the area of risk assessment for nearly two decades as practitioner, reviewer and instructor. For example, he participated in the White House's Office of Science and Technology Policy-led effort to produce a consensus view of cancer in the Federal government; i.e., Cancer Principles. He has been was active in the writing of a number of the Agency's risk assessment guidelines; e.g., for cancer and for mixtures. In a tangential activity, he has worked with the government of Bulgaria to inculcate risk-based decision making in their emerging environmental protection program, both at the ministry and regional levels. He is on the editorial staff of a peer-review journal and serves as a reviewer for a second risk-related journal.

Prior to coming to EPA, Dr. Barnes was Associate Professor and Science Division Chair at St. Andrews Presbyterian College in North Carolina. His formal education includes a BA (chemistry) from the College of Wooster, a PhD (physical chemistry) from the Institute of Molecular Biophysics at Florida State University, and subsequent graduate courses in several health-related areas; i.e., pharmacology, toxicology, immunology, and epidemiology.

His real world education continues to be provided by Dr. Karen K. Barnes and their two sons.

DR. JOHN R. "JACK" FOWLE III

DEPUTY STAFF DIRECTOR

DR. JACK FOWLE joined the staff as Deputy Director in September 1995. In addition to duties with the SAB staff, Dr. Fowle is interested in the use of science to inform policy and works with the Agency's Science Policy Council, co-chairing efforts to implement EPA's Risk Characterization Policy. He is also a member of the Agency's Risk Assessment Forum(RAF), and he chairs the Public Policy Committee for the Society for Risk Analysis.

Dr. Fowle was detailed from EPA to the U.S. Senate as Senator Daniel Patrick Moynihan's Science Advisor from January 1992 until December 1994. While focusing on environmental legislation, he provided advice to the Senator and to the Senate Committee on Environment and Public Works on a wide range of issues. He was the principal staff person working on Senator Moynihan's risk bills in the 102nd and 103rd Congresses.

Before joining Senator Moynihan's staff, Dr. Fowle spent three years in Research Triangle Park, NC as Associate Director of EPA's Health Effects Research Laboratory. He planned and managed EPA's Drinking Water Health Research Program, and coordinated EPA's R&D work efforts with the World Health organization.

Dr. Fowle first came to EPA in 1979 when he joined ORD's Carcinogen Assessment Group, and has served in a variety of other capacities since then. He managed the development of EPA's initial Biotechnology Research Program in 1983 and 1984 and was subsequently detailed to Congressman Gore's Investigation and Oversight Subcommittee, Committee on Science and Technology, as a Science Advisor on Biotechnology issues. He directed the Environmental Health Research staff of the Office of Health Research in ORD at EPA headquarters from 1985 to 1987, and was Health Advisor to EPA's Assistant Administrator for Research & Development in 1988 and 1989, and in 1995.

Dr. Fowle received both his baccalaureate and doctoral degrees in genetics from George Washington University in Washington, DC.

Dr. Fowle, a resident of Washington, DC, is an amateur musician. As a member of the BOOGAG ("Bunch of Old Guys and Gals") bicycle riding club puts in 40 to 60 miles each weekend climbing the hills of western Maryland, northern Virginia and southern Pennsylvania. "It's not a ride unless you climb over 1800 feet."

MR. A. ROBERT FLAAK

TEAM LEADER, COMMITTEE OPERATIONS STAFF; DESIGNATED FEDERAL OFFICER FOR THE CLEAN AIR SCIENTIFIC ADVISORY COMMITTEE

MR. A. ROBERT FLAAK serves as the Team Leader of the Committee Operations Staff of the Board and as Designated Federal Official for the Clean Air Scientific Advisory Committee (CASAC). Mr. Flaak was first associated with the Science Advisory Board (SAB) in 1978-79 when he became the DFO for the Clean Air Scientific Advisory Committee (CASAC) and helped to formally charter CASAC. From 1979-1984 he was an environmental scientist with the Office of Marine Environment and Systems with the US Coast Guard, responsible for environmental compliance. He returned to the Board staff in 1984. Since then he has been the DFO for the following SAB committees: CASAC (1978-1979; 1984-1991; 1995-present); Indoor Air Quality / Total Human Exposure Committee (now the Integrated Human Exposure Committee) (1986-1993); Drinking Water Committee (1991-1993; 1995); ad hoc Industrial Excess Landfill (IEL) Panel (1992-95); Environmental Futures Committee (1993-1995); Research Strategies Advisory Committee (1995-1998), Scientific and Technological Achievement Awards Subcommittee (1997-2000), and a host of SAB subcommittees and working groups involved with issues such as global climate, biotechnology, and reducing risk.

In addition to his duties with the Board, Mr. Flaak has continued his part-time detail (since 1994) to the Agency's Science Policy Council as co-chair of the Agency's Peer Review Advisory Group, providing oversight to EPA on the implementation of its peer review policy. As part of that peer review process oversight, the Agency is preparing to publish the 2nd Edition of EPA's Peer Review Handbook which was coauthored by Mr. Flaak. Since 1988, Mr. Flaak has assisted the General Services Administration (GSA) Office of Government-wide Policy in the development and presentation of its national training course on Federal Advisory Committee Act (FACA) Management. During his tenure as a Trainer with the FACA course, he has taught advisory committee management to nearly 2000 Federal employees. During the past year he has served on the GSA Interagency task group that revised the regulations that implement the Federal Advisory Committee Act.

Mr. Flaak's academic training is in biological oceanography. He graduated from the City College of New York (BS, Zoology, 1972); the University of Delaware's Graduate College of Marine Studies (MS, Marine Studies, 1976); and Central Michigan University (MA, Public Administration, 1979).

DR. K. JACK KOOYOOMJIAN

DESIGNATED FEDERAL OFFICER THE RADIATION ADVISORY COMMITTEE AND THE ENVIRONMENTAL MODELS SUBCOMMITTEE

DR. JACK KOOYOOMJIAN joined the SAB in 1988 as Designated Federal Official (DFO) of Environmental Engineering Committee (EEC). He has served as DFO of the Radiation Advisory Committee (RAC) (1993 - Feb, 2000), the Advisory Council on Clean Air Compliance Analysis (Council) (January 1994 - March of 1999), as well as other committee assignments, including the Drinking Water Committee (DWC), the Environmental Models Subcommittee (EMS) of the SAB Executive Committee and others. He has over 30 years of engineering and professional experience with environmental issues, including over 26 years of diverse experience within EPA Headquarters. Recently (Feb - Oct, 2000) he completed an 8-month detail from the SAB staff to the Office of Cooperative Environmental Management (OCEM), where he assisted in strategic re-focusing of the National Advisory Council for Environmental Policy and Technology (NACEPT) and assisted the Good Neighbor Environmental Board (GNEB) with cross-border issues between the U. S. and Mexico, and a variety of other assignments. He is back at the SAB focusing on assignments with the EEAC, STAA and CASAC.

He began his service with the Agency in 1974 in the Office of Solid Waste (OSW), in the Hazardous Waste Management Division. In 1976 he joined the Office of Water developing guidelines and regulations for industrial wastewater sources. In 1979 he joined the Office of Emergency and Remedial Response (OERR) developing the Superfund multi-media hazardous substance reportable quantity regulations, revising the oil and hazardous substance pollution prevention and oil spill reporting regulations, and managing the oil and dispersant testing/registration under the National Contingency Plan.

Dr. Kooyoomjian received a BS (Mechanical Engrg) from the University of Massachusetts, and a MS (Mgmt. Sci.) and a Ph.D. (Environmental Engrg., with a minor in Economics) from Rensselaer Polytechnic Institute. His academic career includes induction into various honorary societies: e.g., Sigma Xi (research), Chi-Epsilon (civil engrg.), Omicron Delta Epsilon (economics). He has served as a member of the Board of Control of the Water Environment Federation (WEF) and is active in the Federal Water Quality Association (FWQA), the local member association of WEF, having served in numerous capacities, including President. He is currently Chairman of the Gov=t. Affairs Cmtee. of the FWQA. He is listed in "Who's Who in Science and Engineering," and "Who's Who in the Eastern U. S.@

In 1992, he received an honorary professorship for work to develop an environmental engineering bachelors program for the State Engineering University of Armenia (SEUA), and in his assistance in addressing the newly-independent republic of Armenia's environmental problems. In the summer of 1995, he was an invited lecturer in environmental management to the American University of Armenia (AUA) in Yerevan, Armenia. Since 1997, he was selected as Chairman to head the Greater Metropolitan

Washington Area Section (GMWAS) of the Armenian Engineers and Scientists of America (AESA).

Closer to home, which he shares with his wife Gerry, and their three daughters, Jennifer (26), Melissa (21) and Jessica (19), Dr. Kooyoomjian is involved in civic activities focusing on development, land-use and environmental issues in his community. He was nominated for the Governor's Award for volunteerism for the state of Virginia in 1991, has received the EPA Public Service Recognition Award in 1988 and 1992, as well as several County Recognition Awards. In 1995 he received a Virginia State Planning Association award for his civic involvement. In addition to his civic activities, since 1996 he has been serving on the Board of Directors of the Prince William County Service Authority.

MS. KAREN L. MARTIN

DESIGNATED **F**EDERAL **O**FFICER

MS. KAREN L. MARTIN R.S., joined the Science Advisory Board (SAB) in September 1998 as a Intern with Environmental Protection Agency Intern Program (EIP). The EIP program is a component of the Environmental Protection Agency's commitment to diversity action plans and work force development strategies which will have long term positive impacts on the Agency and the environment. This Internship, will allow Ms. Martin to participate in a intensive two-year program of rotational assignments combined with career development training. During Ms. Martin's rotation with the SAB, she assisted the DFO for the Integrated Human Exposure Committee and the Environmental Health Committee. Other assignments included assisting other DFO's with meeting planning, meeting minutes and report preparation.

Prior to joining the SAB, Ms. Martin worked as a Public Health Sanitarian with the Adams County Health Department in West Union, OH. In this position she worked to promote environmental health and the control of sanitation through enforcement of state and local laws and regulations. She also worked closely with other state and local agencies, public officials and the general public to improve environmental health in Adams County.

Ms. Martin pursued undergraduate (B.S. in Biology, 1992) and graduate studies (M.S. in Environmental Health, 1994) at Mississippi Valley State University.

MS. MELANIE MEDINA-METZGER

DESIGNATED FEDERAL OFFICER FOR THE RADIATION ADVISORY COMMITTEE AND THE ENVIRONMENTAL MODELS SUBCOMMITTEE

MS. MELANIE MEDINA-METZGER has been detailed to the EPA Science Advisory Board since February 2000. Also housed in the Office of Administrator (OA) is Melanie's home office, the Office of Cooperative Environmental Management (OCEM). There she worked as the Designated Federal Officer (DFO) for the Good Neighbor Environmental Board, a committee created by the Enterprise for the Americas Initiative Act of 1992 to provide advice to the President and Congress on environmental issues affecting the U.S.–Mexico border area. At OCEM Melanie also completed service as the DFO for EPA's Title VI Implementation Advisory Committee, which reviewed one aspect of "environmental justice"-- the application of Title VI of the Civil Rights Act of 1964 to environmental protection activities linked to federal funding.

Prior to her service at OA Melanie worked for seven years at the Office of Policy, Planning and Evaluation (OPPE). Activities have included managing extramural alternative compliance activities in the Photoimaging industrial sector and performing regulatory review of EPA's farmworker worker protection standards, the Clean Water Act with special emphasis on ocean/coastal protection and conservation. On a special assignment, Melanie joined an EPA group which provided technical assistance to the Chilean Environmental Agency, Consejo National del Medio Ambiente (CONAMA) on the development of cleaner production strategies and policies in the area of pollution prevention.

Melanie joined the Agency in 1991 as an EPA Management Intern and has experience in the full range of EPA's technical and programmatic functions. Her experience includes postings to the Office of International Activities, the Water Management Division (Region IV – Atlanta), the Office of Strategic Planning and Environmental Data in OPPE, and the Office of Wastewater Enforcement and Compliance.

Ms. Medina- Metzger earned her Masters in Science in Environmental Science (MSES) from Indiana University's School of Public and Environmental Affairs (SPEA) and her Bachelors of Science, from the University of Puerto Rico.

Melanie is married and lives in Falls Church, Virginia. She enjoys cross stitching, embroidery, sewing, reading and ikebana (Japanese flower arranging).

MR. TOM MILLER

DESIGNATED FEDERAL OFFICER FOR THE DRINKING WATER COMMITTEE AND THE ENVIRONMENTAL ECONOMICS ADVISORY COMMITTEE

MR. TOM MILLER joined the Science Advisory Board (SAB) in June, 1996 as Designated Federal Official (DFO) for the Drinking Water Committee (DWC) and the Environmental Economics Advisory Committee (EEAC). Tom was detailed to the SAB during 1994 and served as the DFO for the Clean Air Scientific Advisory Committee CASAC) and the Drinking Water Committee at that time. Tom is also the DFO for the Valuation Subcommittee and the Economic Analysis Subcommittee of the Integrated Risk Project. Tom has worked at the Environmental Protection Agency in regulatory (pesticides, toxic substances), budget, and planning activities (research and development programs) since 1974.

Mr. Miller received a BS (Wildlife Management) in 1972 and an MS (Wildlife Management) in 1975, both from West Virginia University. For his Master's research, Mr. Miller conducted a radio-telemetry study of the black bear in the Monongahela National Forest of West Virginia. In 1993, Tom received a Masters of Public Policy from the University of Maryland School of Public Affairs. Tom's major professional interest is the study of the ways that science and policy development interact to identify and implement appropriate approaches to environmental management, and the role of citizens in decisions leading to the selection of management approaches.

Tom is married and is the father of one daughter, Stephanie, and one son, Christopher, (who is University Sophomore). Tom is involved with leadership positions in his church, and he enjoys flyfishing, backpacking, woodworking, and baseball.

DR. ANGELA NUGENT

DESIGNATED FEDERAL OFFICER FOR THE ADVISORY COUNCIL ON CLEAN AIR COMPLIANCE ANALYSIS

DR. ANGELA NUGENT is a historian who has found work at EPA as interesting as combing the archives for the history of public health, science and technology. Angela serves as the DFO for the Council and its two subcommittees, the Health and Ecological Effects Subcommittee and the Air Quality Monitoring Subcommittee. She also has managed several SAB Workshops (SAB/EPA Workshop on the Benefits of Reductions in Exposure to Hazardous Air Pollutants: Developing Best Estimates of Dose-Response Functions; Diffusion and Adoption of Innovations in Environmental Protection; and Workshops on Science and Stakeholder Involvement). She serves as Special Assistant to the Staff Director.

Prior to joining the SAB, Angela was a coordinator for the inter-agency Clean Water Action Plan in EPA's Office of Water. From 1995 to 1998, she was Deputy Director of the Office of Sustainable Ecosystems and Communities in EPA's Policy Office, and from 1992-1995 headed the Science Policy Staff in the same office. She has worked in the Office of Air and Radiation on peer review and air toxics issues, in the Office of Pesticide Programs on reregistration issues, and in the Office of Toxic Substances on biotechnology and new chemical regulation. Prior to joining EPA in 1985, Angela was employed by Arthur Andersen & Associates as a Management Information Consultant. She was an Assistant Professor of the History of Public Health and Medicine at the University of Maryland and a post-doctoral fellow at the Johns Hopkins School of Medicine. She holds a Ph.D. (1982) and M.A. (1976) from Brown University, where her research focused on the history of industrial toxicology. She received a B.S.F.S. degree from Georgetown University's School of Foreign Service in 1974.

Angela is married to Bruce Odessey, a writer-editor for the U.S. Information Agency. She enjoys most of all spending time with him and their four-year old daughter, Rachel. Together, they like to dance, sing, travel, and read.

MR. SAMUEL RONDBERG

DESIGNATED FEDERAL OFFICER FOR THE ENVIRONMENTAL HEALTH COMMITTEE & THE INTEGRATED HUMAN EXPOSURE COMMITTEE

MR. SAMUEL RONDBERG retired from the Senior Executive Service (SES) in August, 1988 and re-entered federal service in November 1988, when he joined the SAB staff. During his previous full and fruitful career at EPA, he served as an Office Director and Associate Office Director in EPA's Office of Research Development (ORD) and the Office of Information Resources Management (OIRM).

Before joining EPA in 1974, Mr. Rondberg held research management, analytical, and policy formulation positions with the Department of Transportation and the Veterans Administration's Department of Medicine and Surgery. He also served in the US Army for two years, with the rank of Captain. Most of his federal career has been devoted to advancing the use of analytic methodologies to address public policy issues, and to improving the management of federal research activities. At EPA, he has directed particular efforts to the complex problems and issues engendered by operating a research program within the context of a regulatory agency--coordination between legal and scientific "cultures"; maintaining a stable long-term program in the face of urgent and frequently changing needs for short-term support; and maintaining an adequate resource base in the face of competition from regulatory programs struggling to meet court or Congressionally mandated deadlines.

Mr. Rondberg pursued undergraduate (AB, 1959) and graduate studies at Washington University, where he also served as a Teaching Assistant in the Graduate School of Arts and Sciences and as a Public Health Service Fellow and Research Associate in the Medical School. In 1967, he was awarded a National Institute of Public Administration Fellowship in Systematic Analysis at Stanford University and completed a special interdisciplinary curriculum in the Schools of Engineering, Graduate Business, and the Departments of Economics and Computer Science.

Mr. Rondberg has authored publications in clinical psychology, research management, and the applications of electronic systems and telemetry to urban transportation.

Sam's wife (Ruth) of 36 years is a Rehabilitation Counselor; they have one daughter, who completed a Master's degree in Social Work. Sam attempts to find time to pursue interests in modern history, the impacts of technology on society and culture, amateur radio, marine aquaria keeping, and antique posters and advertising graphics as a reflection of our social history.

MS. STEPHANIE SANZONE

DESIGNATED FEDERAL OFFICER FOR THE ECOLOGICAL PROCESSES AND EFFECTS COMMITTEE

MS. STEPHANIE SANZONE has been a Designated Federal Official at the EPA Science Advisory Board for 7 years, working primarily with the Ecological Processes and Effects Committee. Ms. Sanzone received a B.A. in Biology, with a minor in chemistry, from the University of Virginia, and a M.S. in Marine Science from the University of South Carolina. Prior to coming to SAB, she spent 4 years with EPA's National Estuary Program, a program which assists states and local communities to manage and protect bays and estuaries based on sound science. Ms. Sanzone has also worked to bring science to the legislative process, serving as legislative staff at both the state and federal levels. Her professional interests include management of coastal environments, the role of science and risk assessment in policy making, and making science and scientists intelligible to lay audiences (e.g., policy makers, managers and the public).

MS. KATHLEEN WHITE

DESIGNATED FEDERAL OFFICER FOR THE ENVIRONMENTAL ENGINEERING COMMITTEE

MS. KATHLEEN WHITE received her BS and MS from Tufts University where she studied biology, public health, and sanitary engineering. Between degrees she wrote for the Hartford Courant. Her work as sanitary engineer -- first for the Massachusetts Department of Public Health and later for U. S. Environmental Protection Agency's Region I -- involved inspecting and trouble shooting problems with water supplies, landfills, and wastewater treatment plants. She also reviewed plans, assisted with outbreak investigations, proposed and provided training. During this time she chaired the Boston Section of the Society of Women Engineers.

Ms. White left field work in New England for paper work at EPA Headquarters in Washington, D.C. Her subsequent service as acting Director for two divisions in the Office of Health Research led to her selection, in 1982, as a participant in the President's Executive Exchange Program. During her exchange year she worked with an occupational health and safety unit at IBM. After returning to EPA, she joined the Science Advisory Board staff as Deputy Director.

In 1989, after deciding to work less and enjoy life more, she resigned as Deputy. She continued to work part-time as a Designated Federal Officer and has supported the Environmental Engineering Committee as DFO since 1993. She is a visual arts volunteer for Arlington County where she lives with her two younger sons, elderly rabbit and temperamental chow. Her eldest son is a student at Hampshire College in western Massachusetts.

MS. DOROTHY MAXINE CLARK

MANAGEMENT **A**SSISTANT

MS. DOROTHY MAXINE CLARK is the Management Assistant who assists Thomas Miller with the Environmental Economics Advisory Committee, Drinking Water Committee and along with Samuel Rondberg with the Chloroform Risk Assessment Review Subcommittee, also Jack Fowle and Jack Kooyoomjian with the Environmental Models Subcommittee. Dorothy joined the Science Advisory Board (SAB) March 17, 1980, as a secretary for the Environmental Engineering Committee, Highlevel Radioactive Level Subcommittee and several other Subcommittees and standing Committees. During her tenure at EPA, Dorothy has worked for several SAB Committees. She enjoys working with committee members and getting along with all levels of staff.

Last but not least, in Dorothy's spare time she enjoys reading, shopping, and most of all watching the Washington Redskins play football.

MS. WANDA R. FIELDS

MANAGEMENT **A**SSISTANT

MS. WANDA R. FIELDS is the Management Assistant who assists Samuel Rondberg with the Environmental Health Committee (EHC) and the Integrated Human Exposure (IHEC) and John R. Fowle with the Research Strategies Advisory Committee (RSAC). She also assisted Thomas Miller and Stephanie Sanzone with the Integrated Risk Project Steering Committee (IRP). Wanda joined the Science Advisory Board (SAB) in the spring of 1997 as a secretary for the Ecological Processes and Effects Committee (EPEC) and the Integrated Risk Project Steering Committee (IRP) where she assisted Stephanie Sanzone. In 1998, her title changed to management assistant. Prior to joining us she was a secretary with the Office of Water for nine years here at the Environmental Protection Agency. During her tour with Water, she took a tremendous amount of computer and administrative training. She graduated with honors from a career enhancement program that was offered by EPA. She is also currently a member of the Office of the Administrator Customer Service Workgroup, established to help implement customer service standards and improve customer service. She came to EPA in 1988 after leaving the Office of Personnel Management where her government career began.

MS. DIANA L. POZUN

MANAGEMENT **A**SSISTANT

DIANA L. POZUN joined the Science Advisory Board as a Staff Secretary in August, 1991. She was assigned to the Environmental Engineering Committee and various subcommittees. In June of 1993, she switched committee responsibilities to be the Staff Secretary for the Radiation Advisory Committee (RAC). In May 1998 her title was changed to Management Assistant. She is now responsible for the Radiation Advisory Committee, Advisory Council on Clean Air Compliance Analysis Committee (COUNCIL) and the Clean Air Scientific Advisory Committee (CASAC). Diana was promoted to Program Specialist in September 2000 to work for Donald Barnes who is the Director of SAB, Jack Fowle Deputy Director and Angela Nugent Special Assistant. She comes to us from the private sector, where she was Executive Secretary in the Big Six accounting firm of Ernst & Whinney in their tax department in Washington, D.C. for about eight years. In that position, she was involved in all aspects of the proposal process and maintained State and Local tracking systems, mailing lists, travel arrangements and word processing support. Prior to that, she worked for the National League of Cities in Washington, D.C. for four years, where she maintained client files, worked on guidebooks and various case studies and helped coordinate several national conferences among other duties. Diana has a broad range of experience with various D.C. area firms. She lives in Mt. Airy, Maryland with her sixteen year old daughter, Megan.

MS. MARY L. WINSTON

MANAGEMENT **A**SSISTANT

MS. MARY L. WINSTON joined the Science Advisory Board (SAB) in 1988. Prior to joining us she worked in the Test Rules and Development Branch here at the Environmental Protection Agency. Mary came to the Environmental Protection Agency after leaving the U.S. Coast Guard where she worked for 14 years as a secretary. In May of 1998 her title changed from secretary to Management Assistant. Before the reorganization she worked with Samuel Rondberg on the Environmental Health Committee and with Thomas Miller on the Drinking Water Committee. Mary now assists Kathleen White with the Environmental Engineering Committee (EEC), also Stephanie Sanzone with the Ecological Processes and Effects Committee (EPEC), and A. Robert Flaak with the Scientific & Technological Achievement Award (STAA) Nominations.

Mary resides in Maryland where she enjoys quilt making, reading and knitting.

MS. BETTY B. FORTUNE

OFFICE **A**SSISTANT

MS. BETTY B. FORTUNE joined the Science Advisory Board in September 1993. Her job title is Office Assistant in the Director's Office. She works closely with the Director, Program Specialist and the Executive Committee. During her years with SAB, and several administrative changes, she has worked for the entire staff and with other SAB committees. Betty came to SAB after completing a long tenure with the District of Columbia Public Schools (DCPS). She was the administrative assistant at Hardy Middle School during the final years of her employment in DCPS. She had always worked in the field of Education and has many pleasant memories of her work years with staff, parents, and students. She has received many plaques, awards, and certificates. She is a member of the Senior Choir at her church which performs excerpts from the Messiah during the Christmas season. She lives in DC and her family consists of two children and four grand-children which she greatly enjoys.

MS. PATRICIA L. THOMAS

TEAM LEADER, COMMITTEE EVALUATIONS SUPPORT STAFF

MS. PATRICIA THOMAS joined the Science Advisory Board in May1994 as a Management Analyst. Pat came to SAB from the Office of Research and Development where she held several positions. Her EPA career started with the Office of Research and Development (ORD) in 1972, where she started as the secretary to the Assistant Administrator for Research and Development, and ended as a Management Analyst in ORD's Office of Health Research (OHR). While with the OHR, Pat assisted the OHR Director, who was the EPA Chairman for the Protection of Human Subjects, with the review of Human Subject packages before they went sent to the EPA contracts and grants office. In addition, she was the International Travel Coordinator, Freedom of Information Officer, and ADP and PC Site Coordinator. Prior to coming to EPA, Pat worked 4 years with the Department of Health, Education, and Welfare. Pat has 32 years of government service and has received numerous outstanding awards while at EPA, including a Bronze Medal.

Pat has been the Team Leader of the Committee Evaluation and Support Staff (CESS) since 1996. The CESS is the administrative arm of the SAB, responsible for budget, personnel, payroll, web development, and reports management, including the monthly Happenings newsletter, and the SAB Annual Report. While with the SAB she devised several systems to assist the SAB staff in tracking information on SAB Members and Consultants. In addition, she created a system that tracks the budget for the ten SAB FACA committees. She is referred to in SAB as the "keeper of the truth."

She spends most of her leisure time traveling.

MS. CAROLYN L. OSBORNE

PROJECT **C**OORDINATOR

MS. **C**AROLYN **O**SBORNE joined the Science Advisory Board (SAB) in 1973 as a Clerk typist and has held several positions since then. She was assigned to the Clean Air Scientific Advisory Committee and various subcommittees working closely with the Executive Secretary as a Staff Secretary. Her government career started at the Department of Health, Education, and Welfare and also with the Food and Drug Administration in 1969. Ms. Osborne is currently the Project Coordinator at the SAB's Committee Evaluation and Support Staff where she is responsible for the budgeting, personnel and administrative matters for more than 450 members and consultants. During Carolyn's tenure at the EPA, she has enjoyed working with the SAB staff, members and consultants and is often referred to as the "SAB Historian."

In Carolyn's past time she enjoys singing in the church choir, reading, traveling and spending time with her family.

MS. VICKIE J. RICHARDSON

MANAGEMENT **A**NALYST

MS. **V**ICKIE **J. R**ICHARDSON joined the Science Advisory Board in May 1994 as an Administrative Clerk to the Committee Evaluation Support Staff (CESS). She has since been promoted to Management Analyst where she performs multifaceted administrative and technical tasks for the Board. She is best known to the staff as the "Queen of Excel", a spreadsheet computer program, but you may be more familiar with the work she does with the *Happenings* newsletter and the SAB Annual Staff Report. She is also the Black Employment Program Manager for the Administrator's Office. In this position, she aids the Agency in carrying out their Affirmative Employment Program. She began her federal career in 1993 with the Department of Defense working for the Air Force Base Conversion Agency, a department that was responsible for closing sparsely populated military facilities throughout the United States. Outside the workplace Vickie believes in giving back to the community. She volunteers in Everybody Wins and For Love Of Children, two organizations that provide mentoring and tutoring opportunities for underpriviledged children in depressed areas in the District of Columbia.

Ms. Richardson received a B.A. in Speech Communications with a minor in Political Science from Old Dominion University, and a M.A. in Public Administration from the George Washington University.

She resides in Maryland where she enjoys reading fictional materials to escape the realities of life.

MS. PRISCILLA Y. TILLERY-GADSON

INFORMATION **M**ANAGEMENT **S**PECIALIST

PRISCILLA Y. TILLERY-GADSON joined the Science Advisory Board (SAB) as the Staff Secretary to the Director in March 1993. She participated in and completed the EPA's Goalsetters Reaching for Opportunities (GRO) Program in 1996. In August 1998, she was reassigned and promoted as a Program Specialist, and in May 2000, she has since been reassigned as an Information Management Specialist on the Committee Evaluation and Support Staff (CESS) providing administrative and technical support to the Director, Deputy Director, and the Team Leader for CESS.

Ms. Tillery-Gadson came to us from EPA's Office of Research and Development (ORD), Office of Health Research (OHR) where she held several positions as Secretary for about $15^{1}/_{2}$ years. She served as OHR International Travel Coordinator and ORD's Headquarters Black Employment Program (BEP) Representative. She also provided updates to the budgetary data in the Office of Research and Development Information System (ORDIS). Prior to working with ORD, she worked with the EPA Office of Pesticides Program (OPP), Registration Division, Insecticide-Rodenticide Branch as a Clerk-Typist and Pesticide Products Clerk for about four years and 10 months. She compiled historical and statistical data for answering inquiries containing scientific data from registrants who applied for registration of their pesticide products.

Prior to coming to EPA, she worked for the U.S. Department of Agriculture for about 1-year under a school/work program. As you can see, Ms. Tillery-Gadson brings a broad range of work experience to SAB, especially the ability to work as a team with her co-workers. She has 29 years of government services, and resides in the Maryland suburbs with her husband and her 27-year-old daughter. She receives a joy in doing for others and has a special love for children.

FY 2000 SAB STAFF TRANSITIONS

Dr. Jack Fowle, Deputy Staff Director, spent 4 weeks in a development program at the Federal Executive Institute.

Mr. Jason Hotten completed his third tour of duty as a summer intern from the University of Maryland Eastern Shore campus.

Dr. Jack Kooyoomjian took part in the first "DFO swap:" between OSAB and our sister office, the Office of Comparative Environmental Management (OCEM). Ms. Melanie Medina-Metzger came to OSAB for the 8-month exchange period. The goal of the exchange is to cross-pollinate two organization who have similar structures and function in the hope/expectation of inducing "hybrid vigor".

Ms. Karen Martin, an EPA Intern for the past two years, successfully completed rotational assignments to Region 4 (Atlanta) and to the Office of Solid Waste and Emergency Response (OSWER).

Ms. Priscilla Tillery-Gadson left the secretarial ranks to accept a position as an Information Management Specialist on the Committee Evaluation and Support Staff (CESS) here in the Office of the Science Advisory Board (OSAB). [In early FY01, her responsibilities for the care and feeding of the Staff Director were taken over by Ms. Diana Pozun, who continues to be ably assisted in this arduous task by Ms. Betty Fortune.